POWER ASSISTED SYSTEM (POWER STEERING)

PS

POWER ASSISTED SYSTEM (POWER STEERING) > General Description

CAUTION

- When performing service operation, refer to "Repair Contents" in "General Description". Ref. to REPAIR CONTENTS>Repair Contents.
- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- Refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- When performing work on the sensors or modules, be careful of the following.
  - Before disconnecting electrical connectors, be sure to disconnect the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  - Do not apply any impact. If the parts are accidentally dropped, replace with a new part.
  - Do not expose to high-temperature and humidity.
- When replacing the parts provided with memory functions, record the memory contents before disconnecting the ground terminal from the battery sensor.
- Apply grease onto sliding or revolving surfaces before installation.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Before starting works, remove dirt and corrosion around the target area.

POWER ASSISTED SYSTEM (POWER STEERING) > General Description

SPECIFICATION

1. SPECIFICATIONS

Assist type		Electric column assist
Minimum turning radius:	m (ft)	5.4 (17.72)
Steering angle	Inner wheel	36.9 °±1.5°
	Outer wheel	31.2 °±1.5°
Lock-to-lock revolution number		2.53
Steering wheel effort: (At standstill on paved road with the assist enabled)	N (kgf, lbf)	33 (3.37, 7.4) or less
Steering wheel effort: (At standstill on paved road with the assist	N (kgf, lbf)	215 (22, 48.5) or less

disabled)	

2. MOTOR (TEMPERATURE 20°C (68°F))

Rated voltage:	V	12
Rated torque:	N·m (kgf-m, ft-lb)	4.35 (0.44, 3.21)
Rated revolution speed:	r/min	1250
Rated current:	A	86.2
Rated output:	W	569

3. STEERING COLUMN

Rotational resistance:	N·m (kgf-m, ft-lb)	1.75 (0.18, 1.31) or less Difference between right and left rotational resistance: 20% or less

4. STEERING WHEEL

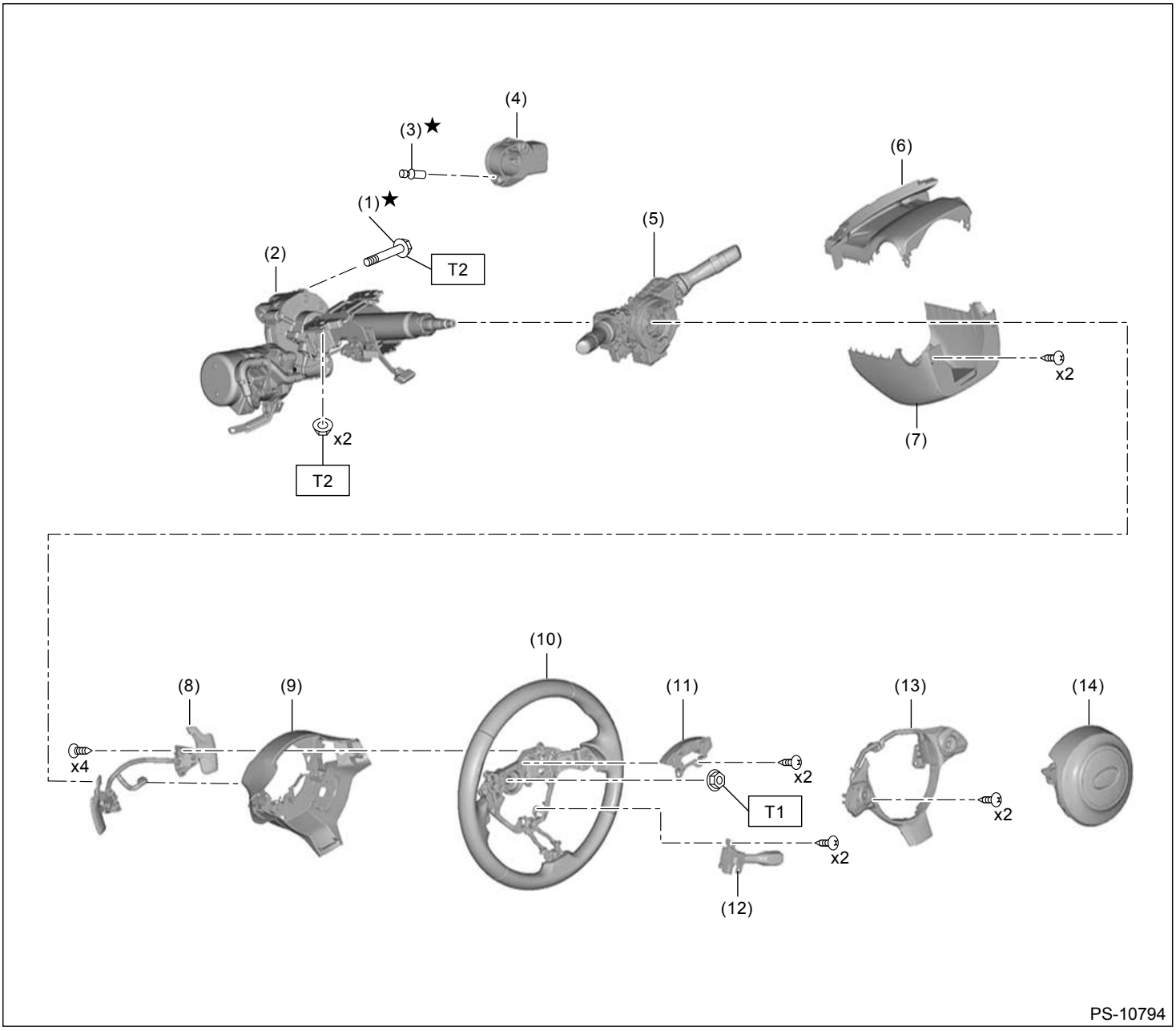
Free play:	mm (in)	30 (1.18) or less
Steering wheel diameter:	mm (in)	362 (14.3)
Clearance: Between steering wheel and column cover assembly	mm (in)	3 (0.12) or more

5. STEERING GEARBOX

Gear type		Rack and pinion
Backlash		0 (pressurized structure)
Rotational resistance:	N·m (kgf-m, ft-lb)	0.9 — 1.6 (0.1 — 0.2, 0.7 — 1.2) Difference between right and left rotational resistance: 20% or less

COMPONENT

1. STEERING WHEEL AND COLUMN



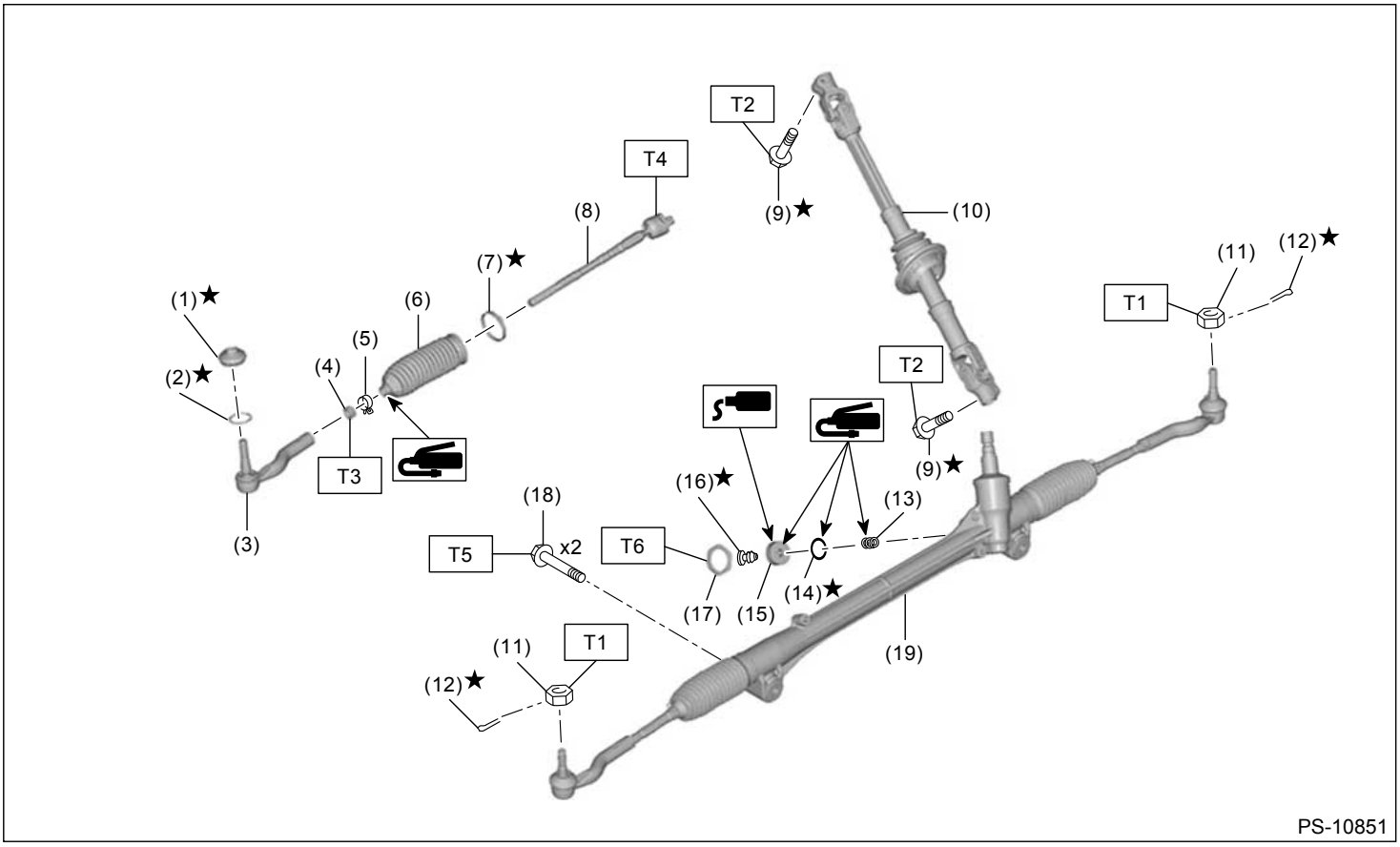
(1) Flange bolt
(2) Column ASSY steering
(3) Set bolt
(4) Steering lock CM
(5) Switch ASSY combination (with steering roll connector)
(6) Column cover UPR
(7) Column cover LWR
(8) Paddle shift switch ASSY (AT model)
(9) Cover steering wheel LWR
(10) Steering wheel
(11) Dynamic damper
(12) Switch ASSY cruise
(13) Satellite switch ASSY
(14) Driver's airbag module

Tightening torque: N·m (kgf-m, ft-lb)

T1: 39 (4.0, 28.8)

T2: 40 (4.1, 29.5)

2. STEERING GEARBOX



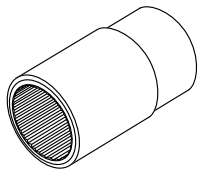
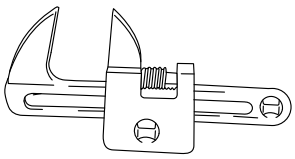
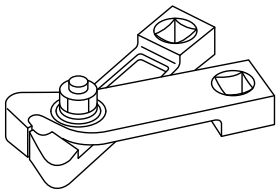
(1) Dust boots	(11) Castle nut	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Clip boot tie-rod end	(12) Cotter pin	***T1: 27 (2.8, 19.9)***
(3) Tie-rod end RH	(13) Spring gearbox	***T2: 38 (3.9, 28.0)***
(4) Lock nut	(14) O-ring	***T3: 85 (8.7, 62.7)***
(5) Clip boot tie-rod	(15) Adjusting screw	***T4: 105 (10.7, 77.4)***
(6) Boot steering gearbox	(16) Cap	***T5: 120 (12.2, 88.5)***
(7) Band boot	(17) Lock nut	***T6:*** Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>ADJUSTMENT.
(8) Tie-rod	(18) Gearbox bolt ASSY	
(9) Flange bolt	(19) Steering gearbox ASSY	
(10) Universal joint ASSY steering		

POWER ASSISTED SYSTEM (POWER STEERING) > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	09616-00020	STEERING	Used for measuring the rotational

 ST0961600020		WORM BEARING ADJUSTING SOCKET	resistance of the column assembly steering and steering gearbox assembly.
 ST0992210010	09922-10010	VARIABLE OPEN WRENCH	• Used for removing and installing the lock nut when adjusting the rotational resistance of the steering gearbox assembly. • Used for removing and installing the tie-rod of the steering gearbox assembly.
 ST28099AC000	28099AC000	Boot band pliers	Used for crimping the band boot of the steering gearbox assembly.
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Steering wheel puller	Used for removing the steering wheel assembly.
Ball joint puller	Used for disconnecting tie-rod end.

POWER ASSISTED SYSTEM (POWER STEERING) > Relay and Fuse

LOCATION

For the location, refer to “FUSE AND RELAY” in the wiring diagram. Ref. to WIRING SYSTEM>Fuse And Relay>LOCATION.

Note:

For details of relay and fuse, refer to “DC POWER SUPPLY CIRCUIT”. Ref. to WIRING SYSTEM>Power Supply Circuit>WIRING DIAGRAM.

POWER ASSISTED SYSTEM (POWER STEERING) > Relay and Fuse

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

Note:

If the fuse is blown again, check the system wiring harness.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

WIRING DIAGRAM

For the wiring diagram, refer to “Electric Power Steering System” in the wiring diagram. Ref. to WIRING SYSTEM>Electric Power Steering System>WIRING DIAGRAM.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

INSPECTION

1. BASIC INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” of “POWER STEERING (DIAGNOSTICS)” section. Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. SYSTEM BLOCK DIAGRAM

For system block diagram, refer to “System Block Diagram” in “POWER STEERING (DIAGNOSTICS)”. Ref. to POWER STEERING (DIAGNOSTICS)>General Description>SYSTEM BLOCK DIAGRAM.

3. MODULE I/O SIGNAL

For the specification (electrical component), refer to “Control Module I/O Signal” of “POWER STEERING (DIAGNOSTICS)” section. Ref. to POWER STEERING (DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

NOTE

For operation procedures of components of the power steering system, refer to the following sections.

- Steering wheel: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel.
- Universal joint: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint.
- Steering column: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column.
- Steering gearbox: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox.

REMOVAL

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

Note:

The following parts can be replaced when the steering wheel assembly is installed to the vehicle.

- **Satellite switch assembly: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Switch>REMOVAL > SATELLITE SWITCH ASSEMBLY.**
- **Dynamic damper: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.**
- **Cruise control command switch: Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>REMOVAL.**

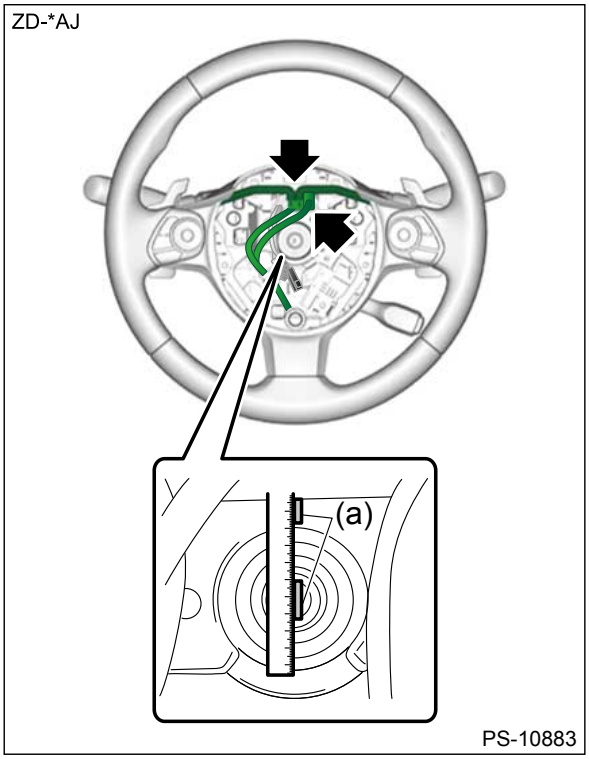
1. Set the steering wheel to the straight-ahead position.
2. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel assembly.

Caution:

- **Always use the steering wheel puller for removal to avoid deforming the steering wheel.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**

(1) Disconnect the connector and remove the nut.

(2) Place a ruler as shown in the figure, and place alignment marks (a) on the steering wheel assembly and column assembly steering shaft.



(3) Remove the steering wheel assembly using a steering wheel puller.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Wheel

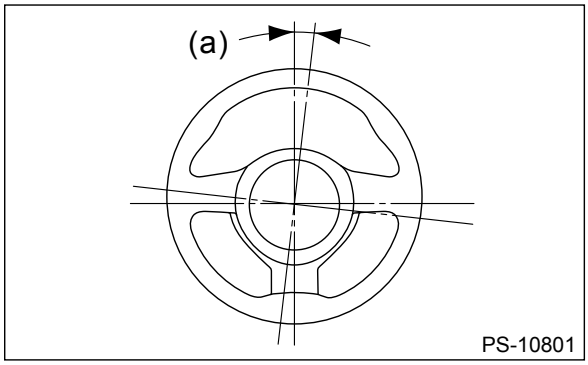
INSTALLATION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**
- **When installing the steering wheel, make sure it is aligned the same way it was when you removed it.**

1. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
2. Install the steering wheel assembly, and connect the connector.
   Tightening torque:
   39 N·m (4.0 kgf-m, 28.8 ft-lb)
   Clearance:
   Column cover assembly to steering wheel: 3 mm (0.12 in) or more
3. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
4. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. If you have replaced the steering wheel assembly, check the position of the steering wheel with respect to the straight-ahead position of the vehicle.

(1) When the steering wheel is in the following condition, perform the steering wheel installation over again.
- When the wheels are set in the straight-ahead position, the steering wheel spokes are not horizontal.
- Error is more than 2° on the periphery of the steering wheel.



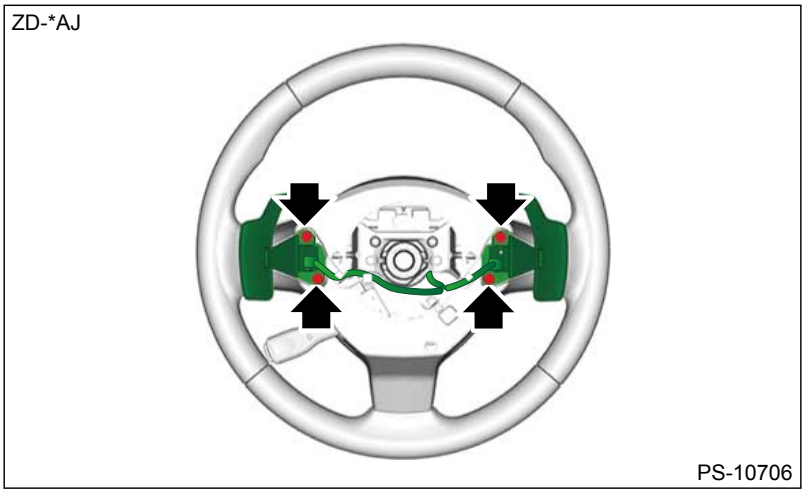
(a) Within 2°

6. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Wheel

DISASSEMBLY

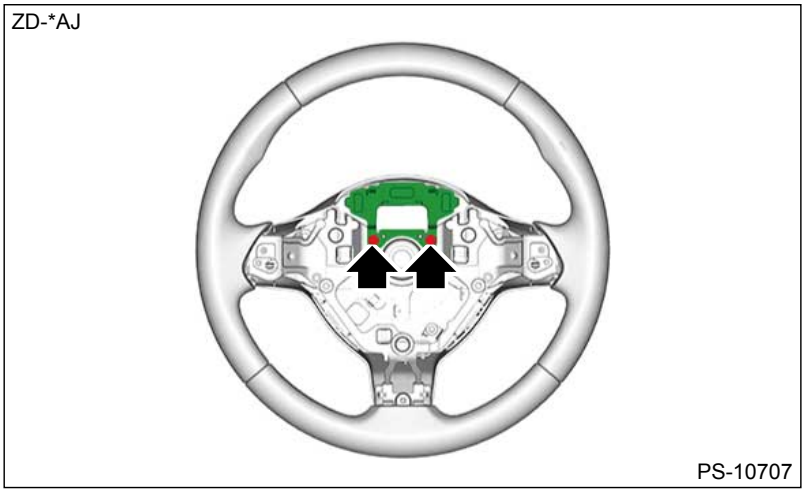
1. Remove the screws to remove the paddle shift switch assembly. (AT model)



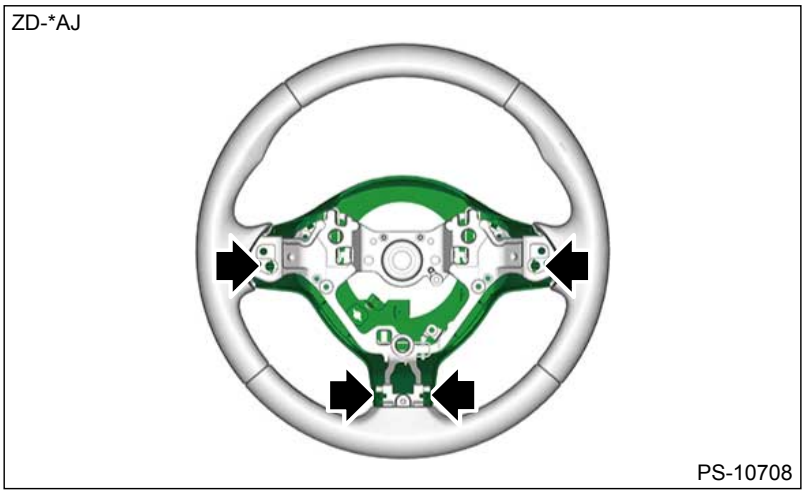
2. Remove the satellite switch assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Switch>REMOVAL > SATELLITE SWITCH ASSEMBLY.

3. Remove the switch assembly cruise. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>REMOVAL.

4. Remove the screws, and then remove the dynamic damper.



5. Disengage the claws, and remove the cover steering wheel LWR.



POWER ASSISTED SYSTEM (POWER STEERING) > Steering Wheel

ASSEMBLY

Caution:
Securely install the switch and the cover steering wheel LWR. Improper insertion of the pins or claws of the switch and the cover steering wheel LWR may cause improper installation.

1. Install the cover steering wheel LWR.
2. Install the dynamic damper.
3. Install the switch assembly cruise. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>INSTALLATION.
4. Install the satellite switch assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Switch>INSTALLATION > SATELLITE SWITCH ASSEMBLY.
5. Install the paddle shift switch assembly. (AT model)

REMOVAL

1. PADDLE SHIFT SWITCH ASSEMBLY

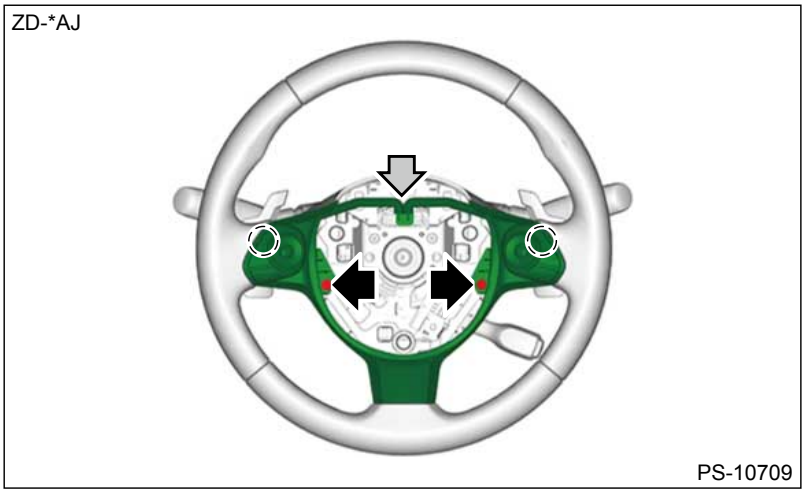
Caution:
Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Set the steering wheel to the straight-ahead position.
2. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the paddle shift switch assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.

2. SATELLITE SWITCH ASSEMBLY

Caution:
Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
3. Remove the satellite switch assembly.
   (1) Disconnect the connector.
   (2) Remove the screws and release the claws, and then remove the satellite switch assembly.



3. CRUISE CONTROL COMMAND SWITCH

For operation procedures of the cruise control command switch, refer to "Cruise Control Command Switch" in the "CRUISE CONTROL SYSTEM" section. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>REMOVAL.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Switch

INSTALLATION

1. PADDLE SHIFT SWITCH ASSEMBLY

Caution:
Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the paddle shift switch assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>ASSEMBLY.
2. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
3. Install the steering wheel assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSTALLATION.
4. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
5. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. SATELLITE SWITCH ASSEMBLY

Caution:
Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the satellite switch assembly, and then connect the connector.
2. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
3. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

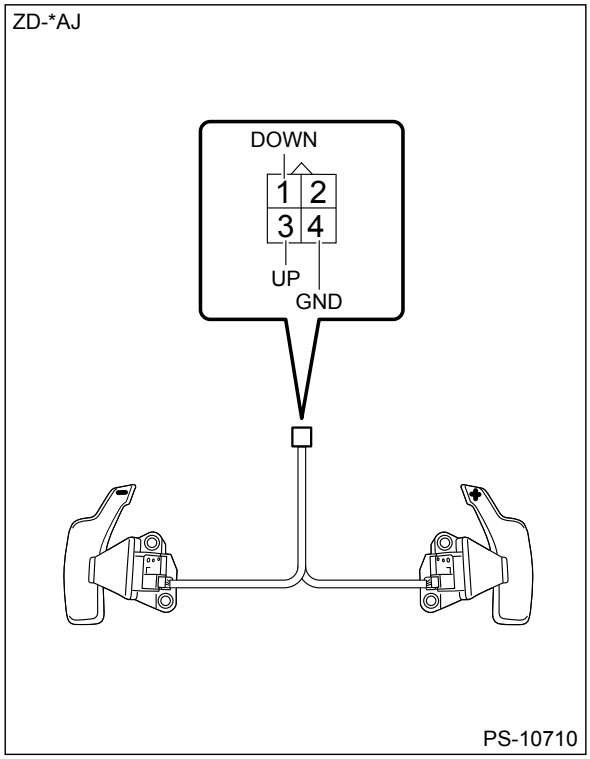
3. CRUISE CONTROL COMMAND SWITCH

For operation procedures of the cruise control command switch, refer to "Cruise Control Command Switch" in the "CRUISE CONTROL SYSTEM" section. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>INSTALLATION.

INSPECTION

1. PADDLE SHIFT SWITCH ASSEMBLY

1. Measure the resistance between connector terminals.



Terminal No.	Inspection conditions	Standard
3 — 4	Operate the + side of paddle shift and hold it.	Less than 10 Ω
1 — 4	Operate the − side of paddle shift and hold it.	Less than 10 Ω
1 — 4 3 — 4	Do not operate the paddle shift.	1 MΩ or more

2. Replace the paddle shift switch assembly if the inspection result is not within the standard value.

2. SATELLITE SWITCH ASSEMBLY

For inspection details, refer to the following sections.

- Audio (navigation) switch: Ref. to ENTERTAINMENT & MONITORING>Switches and Harness>INSPECTION > STEERING SWITCH.
- EyeSight steering switch: Ref. to EyeSight>Steering Switch>INSPECTION.
- Multi information display switch: Ref. to INSTRUMENTATION/DRIVER INFO>Switches and Harness>INSPECTION > MULTI INFORMATION DISPLAY SWITCH.

3. CRUISE CONTROL COMMAND SWITCH

For the inspection of the cruise control command switch, refer to “Cruise Control Command Switch” in the “CRUISE CONTROL SYSTEM” section. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command

Switch>INSPECTION.

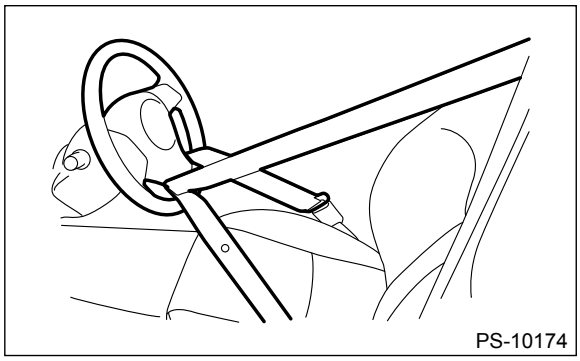
REMOVAL

1. Set the steering wheel to the straight-ahead position.
2. Adjust the tilt position of the column assembly steering to the neutral position.

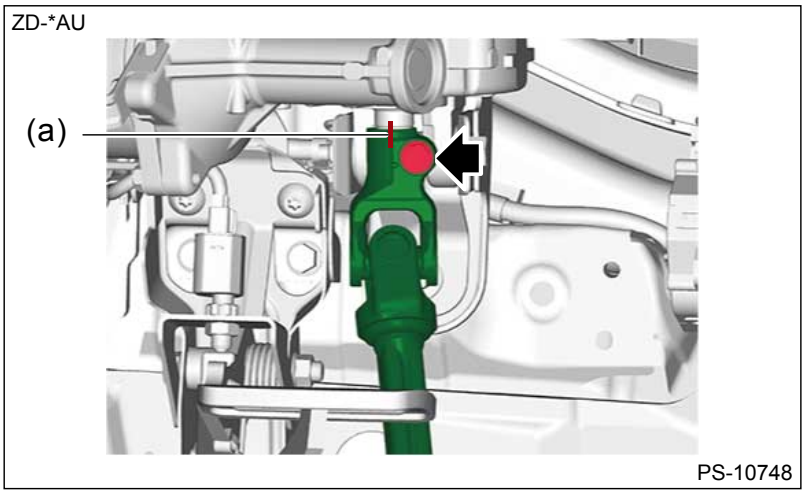
Caution:
Place the tilt lever to the lock position after the column assembly steering is adjusted.

3. Prevent the steering wheel from turning using the seat belt.

Caution:
Make sure the steering wheel is firmly secured to avoid damaging the harness.

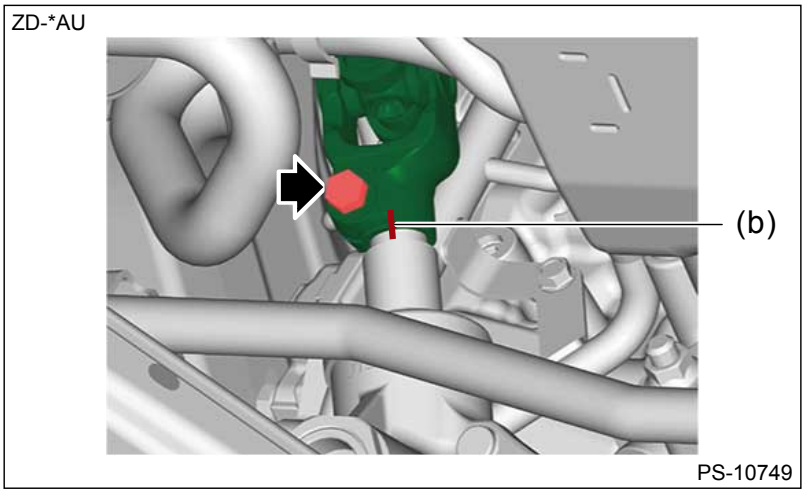


4. Disconnect the upper side of the universal joint assembly steering.
   (1) Place an alignment mark (a) between the column assembly steering and universal joint assembly steering.
   (2) Remove the bolt, and disconnect the upper side of the universal joint assembly steering.

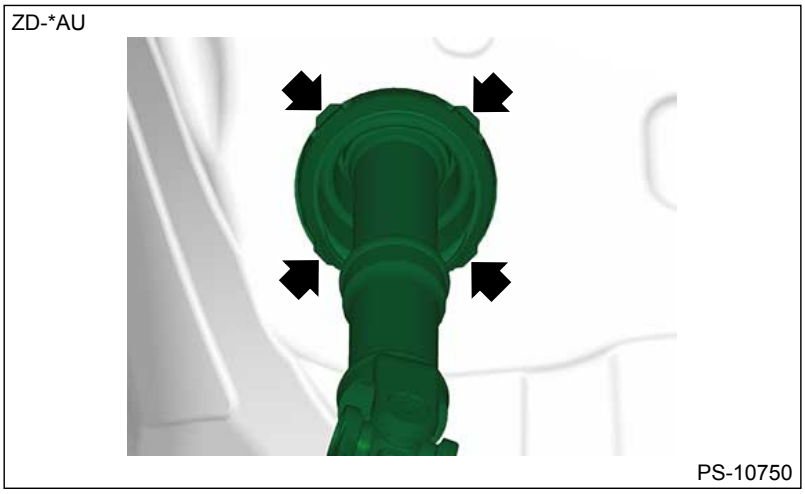


5. Remove the under cover front and the under cover COMPL front T/M. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
6. Remove the universal joint assembly steering.
   (1) Place an alignment mark (b) between the steering gearbox assembly and universal joint assembly steering.

(2) Remove the bolt, and disconnect the lower side of the universal joint assembly steering.



(3) Disengage the dust seal claws from the vehicle exterior.



(4) Remove the universal joint assembly steering from the vehicle interior.

POWER ASSISTED SYSTEM (POWER STEERING) > Universal Joint

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **When installing the universal joint assembly steering, make sure the steering wheel is in the straight-ahead position.**
- **When installing the universal joint assembly steering, make sure it is aligned the same way it was when you removed it.**

1. Before installation, check the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
2. Install the universal joint assembly steering.

Caution:

- **Be sure to follow the tightening order and tightening torque of the universal joint assembly steering to avoid the steering effort from becoming heavy.**
- **When tightening the mounting bolts of the universal joint assembly steering, always tighten the gearbox side bolts first.**
- **Make sure the steering wheel is firmly secured to avoid damaging the harness.**

(1) Connect the universal joint assembly steering on the lower side first and then on the upper side by matching the alignment marks that were placed during the removal.

(2) Use new flange bolts and tighten the ones on the gearbox side first, followed by the ones on the column shaft side.

Tightening torque:

38 N·m (3.9 kgf-m, 28.0 ft-lb)

Clearance:

Universal joint assembly steering to adjacent parts: 15 mm (0.59 in) or more

(3) Install the dust seal.

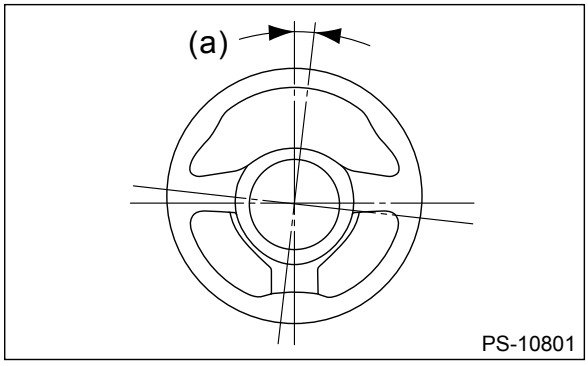
3. Install the under cover COMPL front T/M and the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.

4. Unfasten the seat belt and make the steering wheel turn freely.

5. If you have replaced the universal joint assembly steering, check the position of the steering wheel with respect to the straight-ahead position of the vehicle.

(1) When the steering wheel is in the following condition, perform the steering wheel installation over again.

- When the wheels are set in the straight-ahead position, the steering wheel spokes are not horizontal.
- Error is more than 2° on the periphery of the steering wheel.



(a) Within 2°

6. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

POWER ASSISTED SYSTEM (POWER STEERING) > Universal Joint

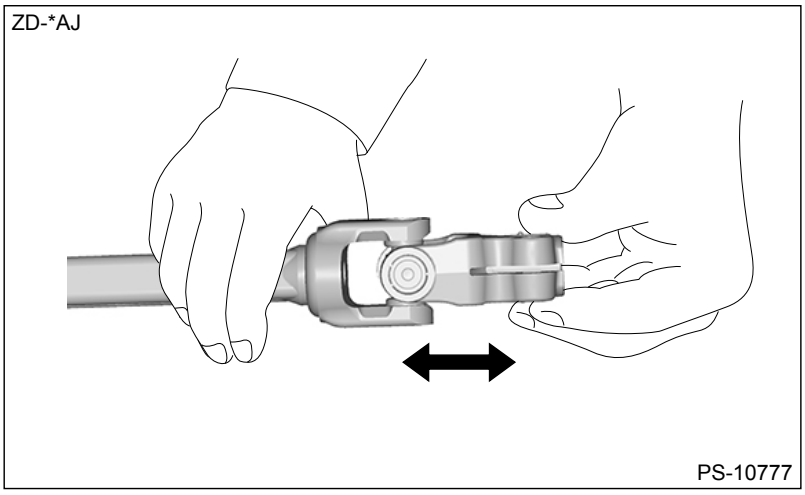
INSPECTION

Check for wear, damage or any other faults.

1. Check the universal joint assembly steering for excessive looseness.

Service limit:

Play of the universal joint assembly steering: 0 mm (0 in)



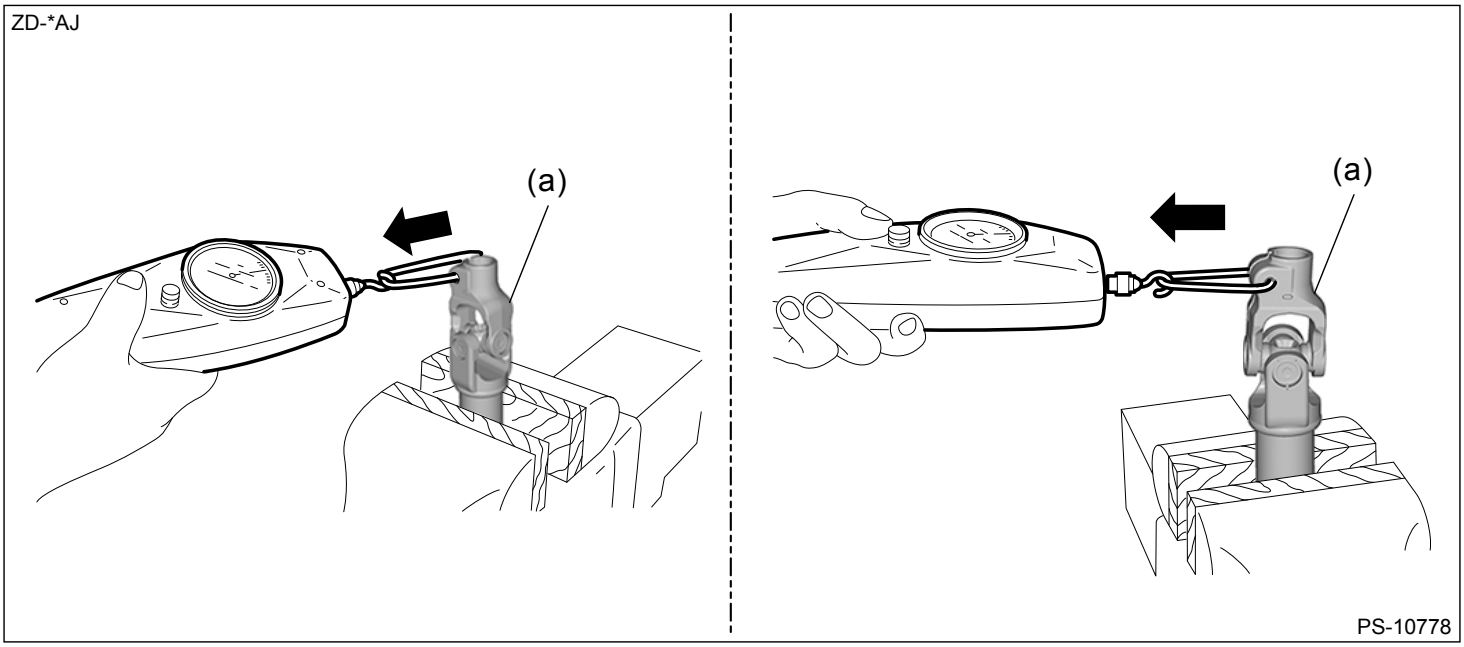
2. Measure the swing load of the universal joint assembly steering.

(1) Place the universal joint assembly steering between wooden blocks and fix it on a vise.

(2) With the yoke (a) of gearbox side facing up, measure the swing load in two directions.

Service limit:

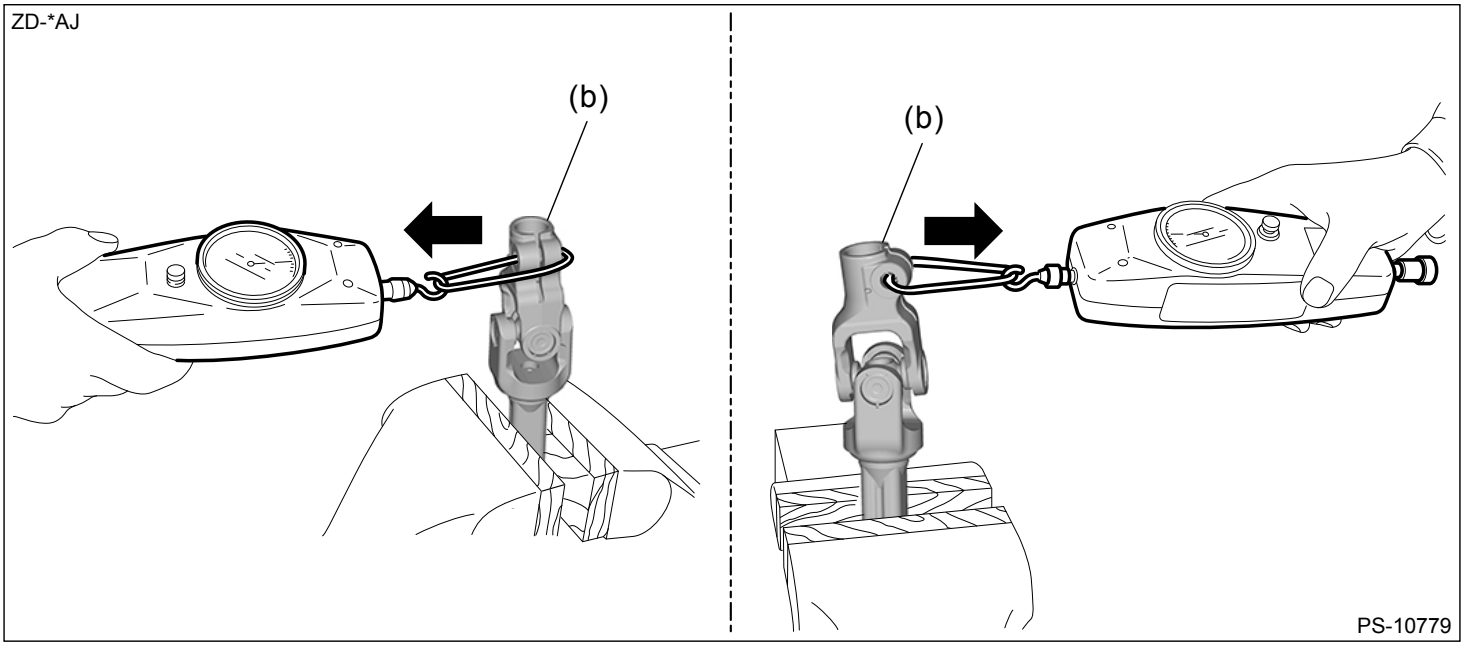
Maximum load: 6.8 N (0.69 kgf, 1.52 lbf) or less



(3) With the yoke (b) of the column assembly steering side facing up, measure the swing load in two directions.

Service limit:

Maximum load: 5.9 N (0.60 kgf, 1.33 lbf) or less



(4) Replace as necessary, if it is found defective.

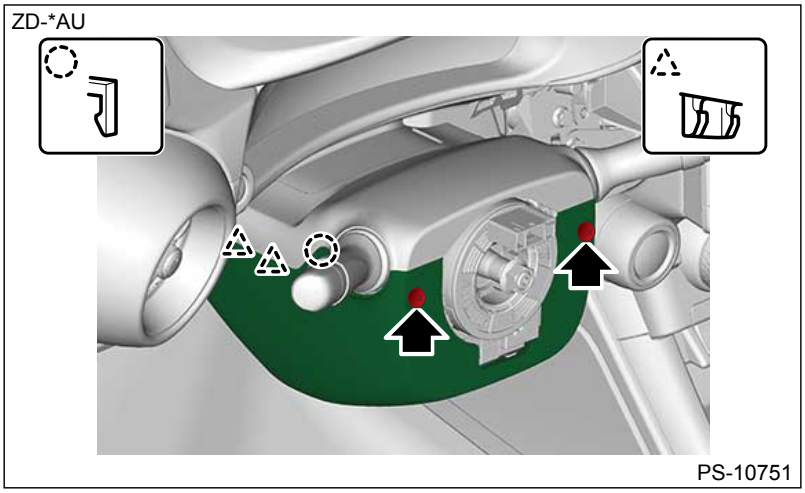
REMOVAL

Caution:
Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

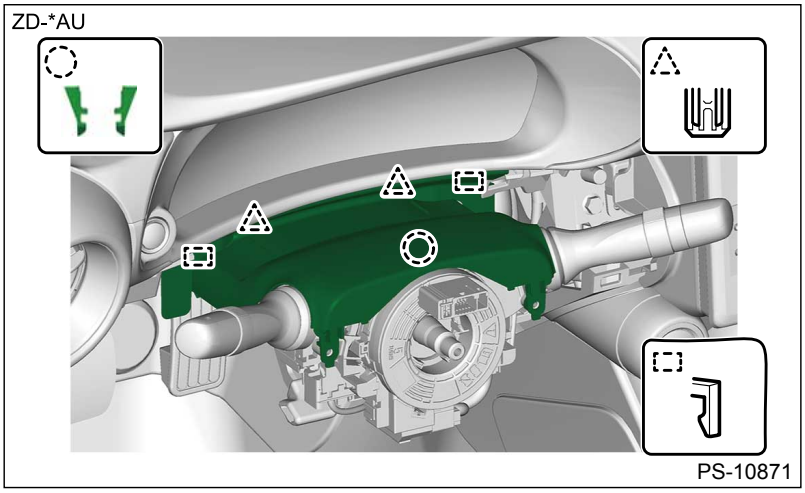
1. Set the steering wheel to the straight-ahead position.
2. Adjust the tilt position of the column assembly steering to the neutral position and the telescopic position to the longest position.

   Caution:
   Place the tilt lever to the lock position after the column assembly steering is adjusted.
3. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
5. Remove the steering wheel assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
6. Remove the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
7. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
8. Remove the column cover assembly.
   (1) Remove the screws.
   (2) Release the claw and the positioning pin, and remove the column cover LWR.

   Note:
   Release the claws on RH side in the same procedure as on the LH side.



   (3) Release the claws and remove the column cover UPR.



9. Remove the switch assembly combination.

(1) Disconnect the connector.

(2) Using pliers, loosen the clamp.

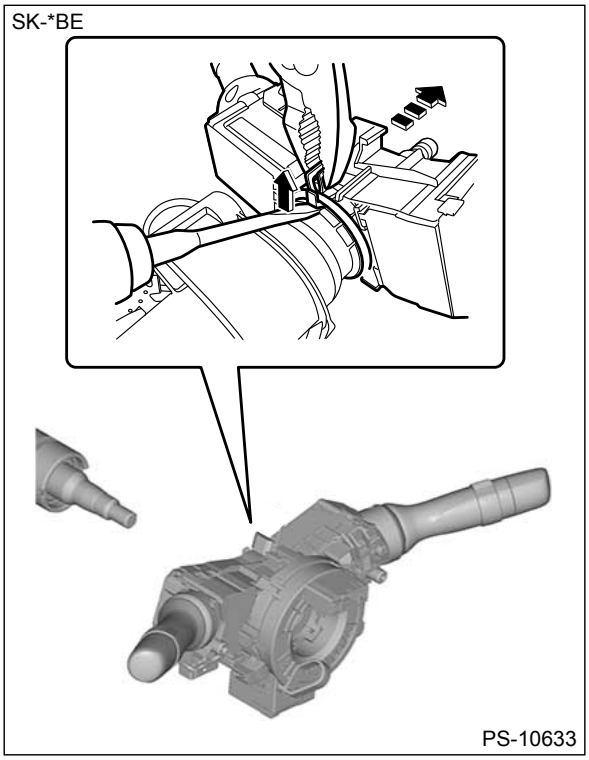
(3) With the clamp loosened, release the claw using a flat tip screwdriver wrapped with protective tape, and remove the switch assembly combination.

Caution:

Do not pry off forcibly. Otherwise, the claws may be damaged.

Note:

Remove the switch assembly combination together with the steering roll connector as an assembly.



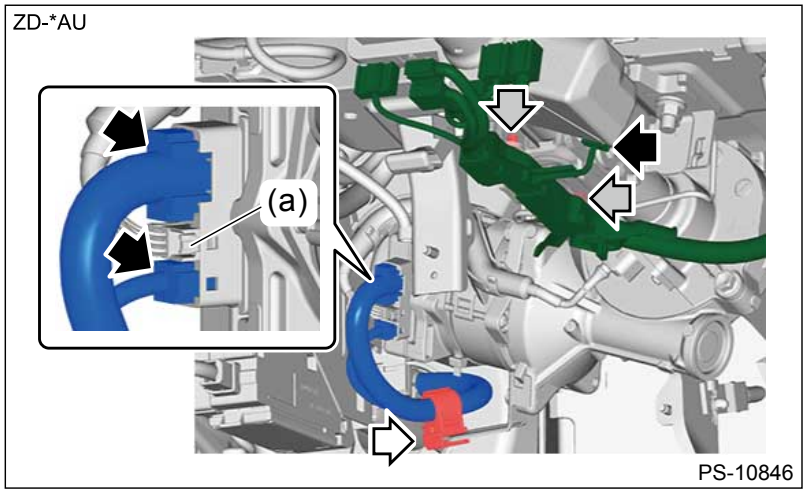
10. Disconnect the upper side of the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

11. Remove the column assembly steering.

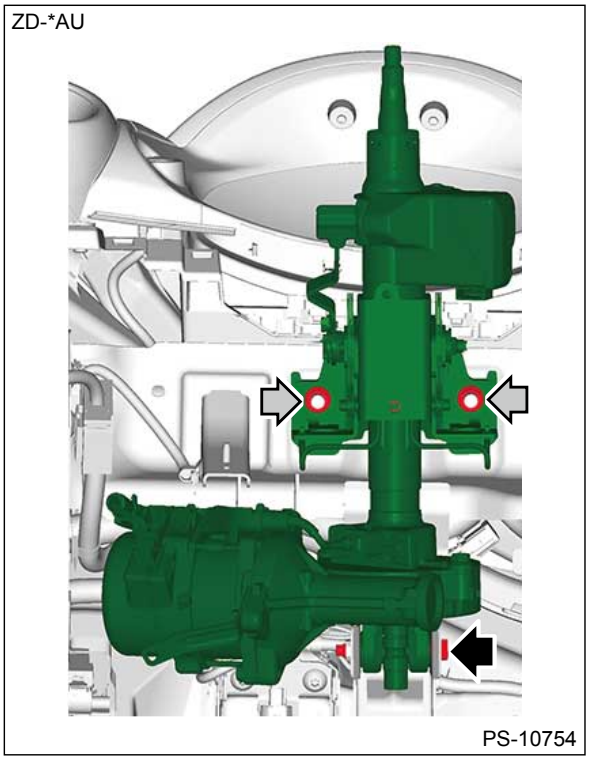
Caution:
Never loosen the tilt lever when the column assembly steering is not secured to the vehicle.

(1) Remove all the connectors and harness clamps from the column assembly steering.

Caution:
Do not disconnect the torque sensor connector (a).



(2) Remove the bolts and nuts, and remove the column assembly steering.



12. Remove the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM>REPLACEMENT.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Column

INSTALLATION

Caution:

- **Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **For the non-reusable parts, always use new parts.**

1. Install the column assembly steering.
   (1) Install the column assembly steering with the tilt lever fixed.

   Caution:
   Never loosen the tilt lever.

   Tightening torque:
   40 N·m (4.1 kgf-m, 29.5 ft-lb)

   (2) Connect each connector.
2. Install the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM>REPLACEMENT.
3. Connect the upper side of the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.

   Caution:
   - **Always connect the universal joint assembly steering after installing the column assembly steering to avoid damage to the universal joint assembly steering.**
   - **Be sure to observe the tightening torque of the universal joint assembly steering to avoid the steering effort from becoming heavy.**
   - **When installing the universal joint assembly steering, make sure it is aligned the same way it was when you removed it.**
4. Install the switch assembly combination. Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSTALLATION.
5. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
6. Connect all the connectors under the instrument panel.
7. Install the column cover assembly.
   (1) Attach the claws of the column cover UPR to the switch assembly combination.
   (2) Attach the column cover LWR to the column cover UPR, and then secure it with the screws.
   (3) Attach the claws of the column cover UPR to the visor assembly LWR.

   Note:
   When installing the components, be careful not to peel off the surface of the column cover UPR.
8. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
9. Install the cover LWR driver OUT and cover LWR driver INN. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
10. Install the steering wheel assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSTALLATION.

Caution:

- **When installing the steering wheel assembly, make sure it is aligned the same way it was when you removed it.**
- **Check the position of the steering wheel with respect to the straight-ahead position of the vehicle.**

11. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.

12. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

Note:

Place the tilt lever to the lock position after the column assembly steering is adjusted.

13. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

14. When the column assembly steering has been replaced, removed or installed, perform steering sensor correction. Ref. to POWER STEERING (DIAGNOSTICS)>Work Support>LIST > STEERING SENSOR REVISION.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Column

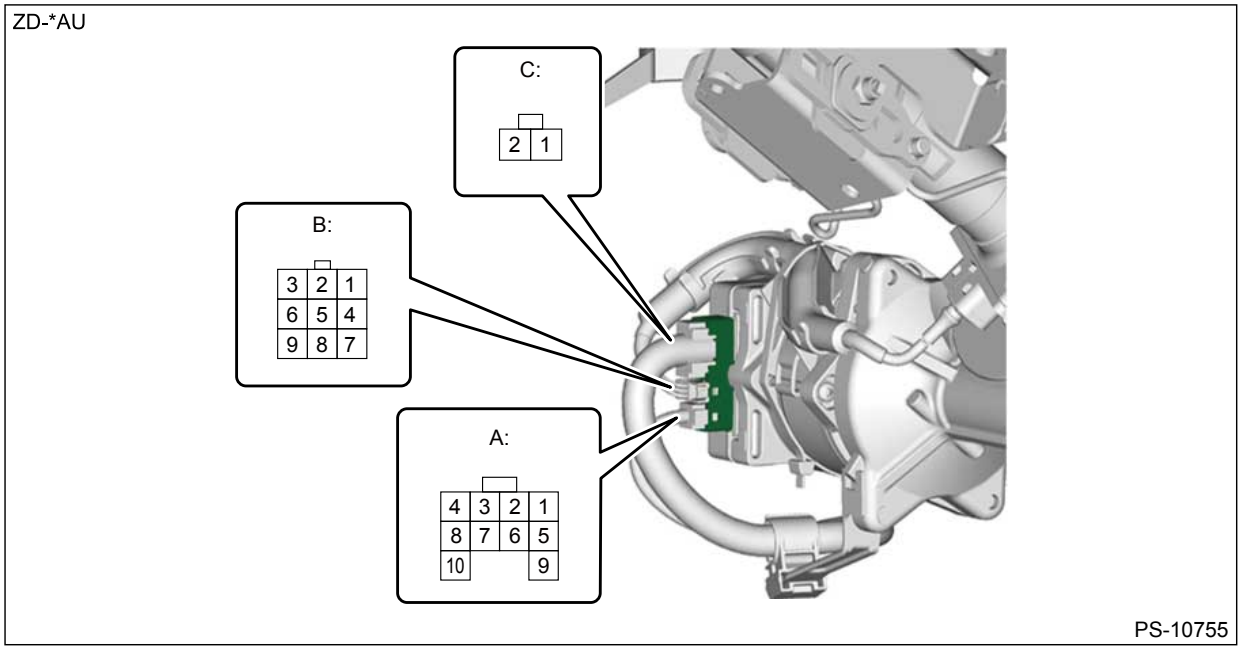
INSPECTION

1. ON THE VEHICLE INSPECTION

1. Measure the voltage and resistance for the following items.

Note:

The terminal numbers indicate the module side of the column assembly steering.



Terminal No.	Contents	Measuring condition	Standard
A No. 1 — Chassis ground	Ignition power supply input	Ignition switch ON	9 — 16 V

A No. 7 — A No. 8	CAN signal input/output	Ignition switch OFF, connector disconnected	5 — 150 kΩ
A No. 3 — A No. 4	CAN signal input/output	Ignition switch OFF, connector disconnected	114 — 126 Ω
B No. 7 — B No. 8	Torque sensor power supply 1 input	Ignition switch ON	4.8 — 5.2 V
B No. 3 — B No. 2	Torque sensor power supply 2 input	Ignition switch ON	4.8 — 5.2 V
B No. 9 — B No. 8	Torque sensor signal 1 input	During engine start, no steering load (neutral position)	2.3 — 2.7 V
		During engine start, steering to the right (when the vehicle is stopped)	2.3 — 3.8 V
		During engine start, steering to the left (when the vehicle is stopped)	1.2 — 2.7 V
B No. 1 — B No. 2	Torque sensor signal 2 input	During engine start, no steering load (neutral position)	2.3 — 2.7 V
		During engine start, steering to the right (when the vehicle is stopped)	1.2 — 2.7 V
		During engine start, steering to the left (when the vehicle is stopped)	2.3 — 3.8 V
B No. 8 — Chassis ground	Torque sensor GND 1	Always	Less than 1 Ω
B No. 2 — Chassis ground	Torque sensor GND 2	Always	Less than 1 Ω
C No. 1 — Chassis ground	Motor power supply input	Always	9 — 16 V
C No. 2 — Chassis ground	Power GND	Always	Less than 1 Ω

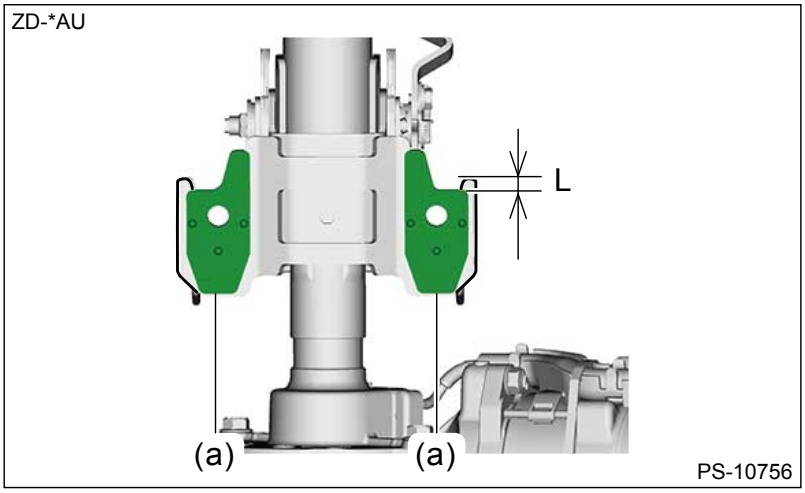
2. UNIT INSPECTION

1. Check that the aluminum capsule (a) is securely installed to the column assembly steering without play.

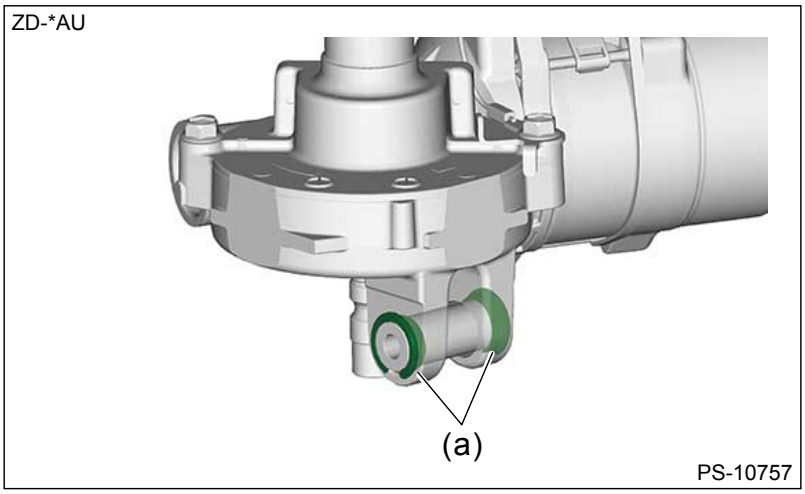
Specification:

Length L between the column assembly steering and aluminum capsule

5 mm (0.67 in) or more



2. Check that the bushing (a) is not disconnected, deformed, cracked, or otherwise damaged.



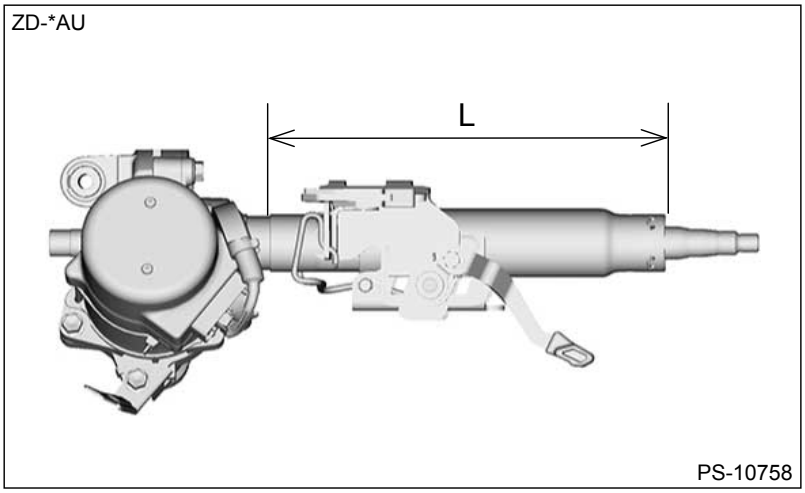
3. Check the following items, and if there is anything out of standard value, it is considered to be damaged. If so, replace it with a new part.

(1) Measure the overall length of the column assembly steering jacket.

Standard: Overall length L of the jacket

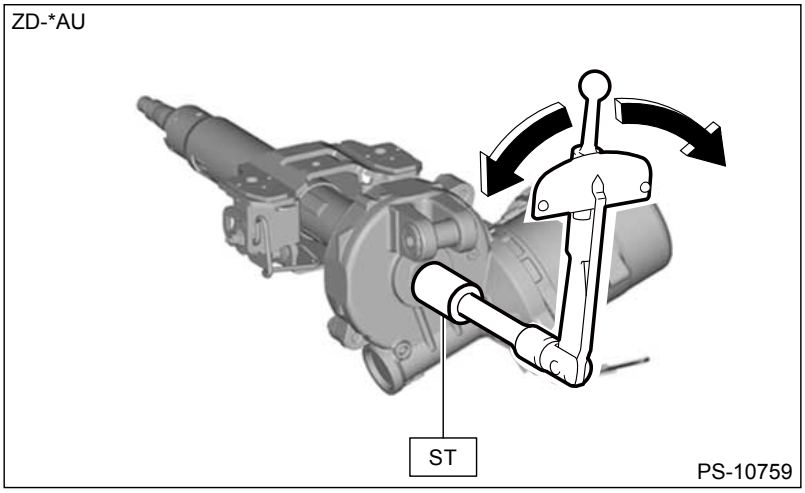
Tilt and telescopic column (measure while minimized)

238 mm (9.37 in) or more



(2) Check the rotational resistance.

1. Using the ST and a torque wrench, measure the rotational resistance of the column assembly steering.
   Preparation tool:
   ST: STEERING WORM BEARING ADJUSTING SOCKET (09616-00020)
   Service limit:
   Rotational resistance: 1.75 N·m (0.18 kgf-m, 1.31 ft-lb) or less



3. INSPECTION OF AIRBAG SYSTEM

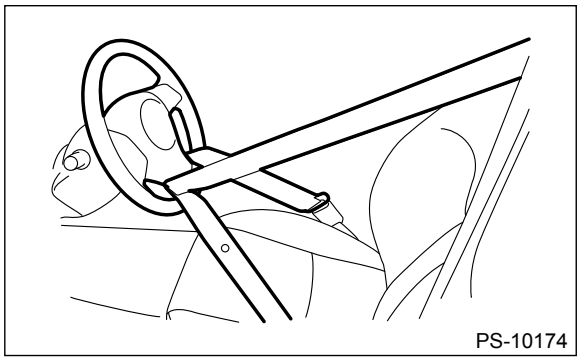
For the airbag inspection procedure, refer to the "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.

REMOVAL

1. Set the steering wheel to the straight-ahead position.
2. Adjust the tilt position of the column assembly steering to the neutral position.

   Caution:
   Place the tilt lever to the lock position after the column assembly steering is adjusted.
3. Prevent the steering wheel from turning using the seat belt.

   Caution:
   Make sure the steering wheel is firmly secured to avoid damaging the harness.



4. Remove the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
5. Remove the under cover front and the under cover COMPL front T/M. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
6. Remove the under cover rear. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>REMOVAL.
7. Remove the sub frame front LWR C COMPL. Ref. to FRONT SUSPENSION>Sub Frame>REMOVAL.
8. Remove the stabilizer front and the sub frame COMPL as a unit. Ref. to FRONT SUSPENSION>Stabilizer>REMOVAL > STABILIZER.
9. Disconnect the tie-rod end. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>REMOVAL.
10. Disconnect the lower side of the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.
11. Remove the bolts, and then remove the steering gearbox assembly.

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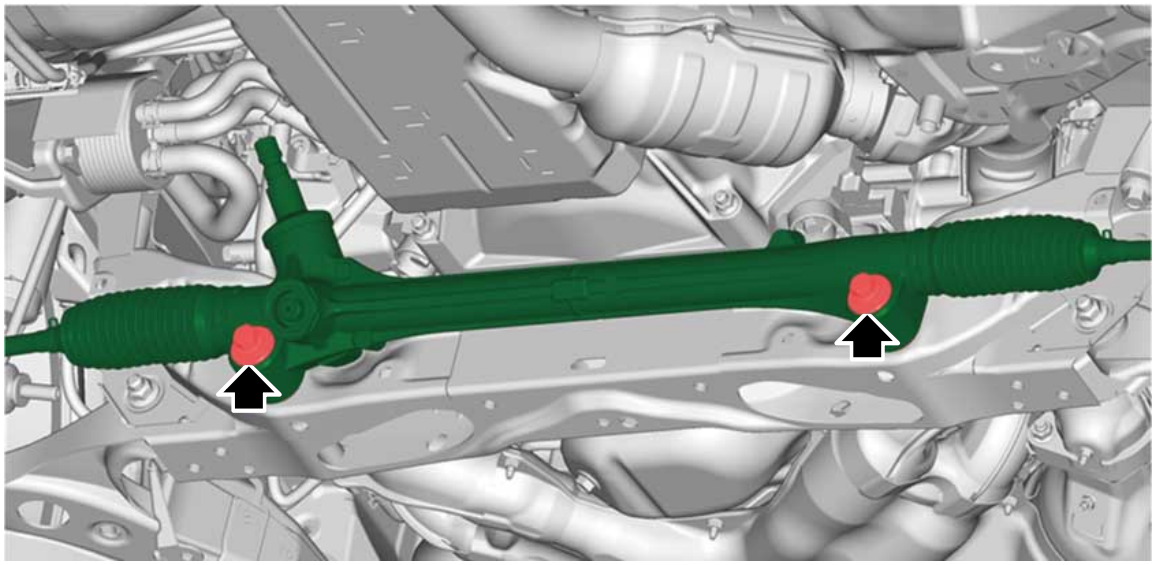


PS-10760

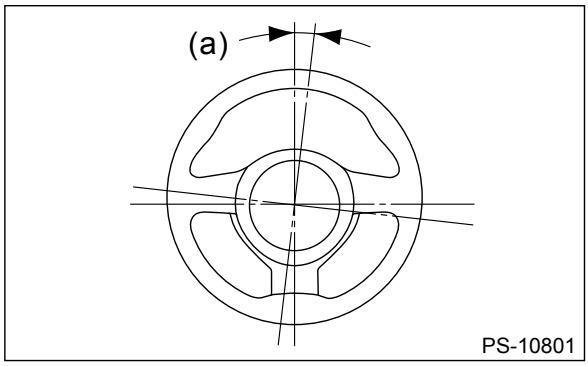
POWER ASSISTED SYSTEM (POWER STEERING) > Steering Gearbox

INSTALLATION

Caution:
For parts which are not reusable, always use new parts.

1. Install the steering gearbox assembly.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
2. Connect the lower side of the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
3. Connect the tie-rod ends. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>INSTALLATION.
4. Install the stabilizer front and the sub frame COMPL as a unit. Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER.
5. Install the sub frame front LWR C COMPL. Ref. to FRONT SUSPENSION>Sub Frame>INSTALLATION.
6. Install the under cover rear. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>INSTALLATION.
7. Install the under cover COMPL front T/M and the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
8. Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
9. Unfasten the seat belt and make the steering wheel turn freely.
10. If you have replaced the steering gearbox assembly, check the position of the steering wheel with respect to the straight-ahead position of the vehicle.
    (1) When the steering wheel is in the following condition, perform the steering wheel installation over again.

- When the wheels are set in the straight-ahead position, the steering wheel spokes are not horizontal.
- Error is more than 2° on the periphery of the steering wheel.

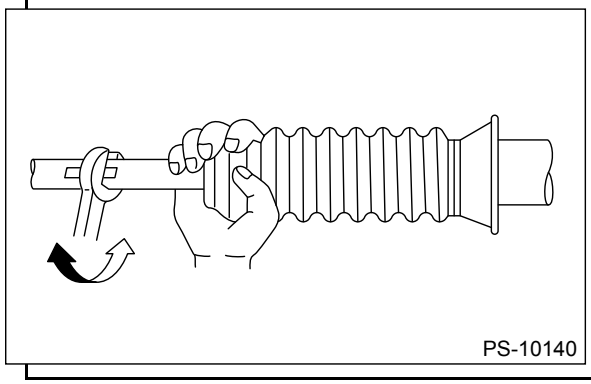


(a) Within 2°

11. After adjusting toe-in and steering angle, tighten the lock nut on tie-rod end.

Caution:
Secure the width across flat portion of the tie-rod end with a tool, and then tighten the lock nut.

Note:
When adjusting toe-in, hold the boot steering gearbox as shown to prevent it from being rotated or twisted. If it becomes twisted, straighten it.



Tightening torque:
85 N·m (8.7 kgf-m, 62.7 ft-lb)

12. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

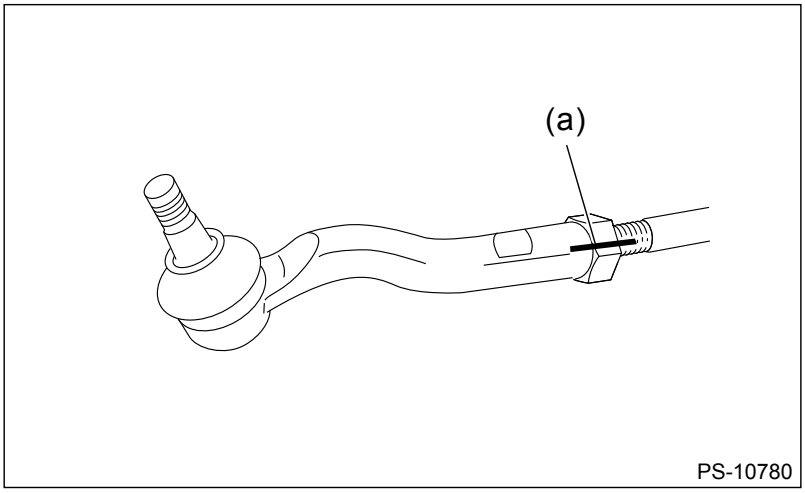
POWER ASSISTED SYSTEM (POWER STEERING) > Steering Gearbox

DISASSEMBLY

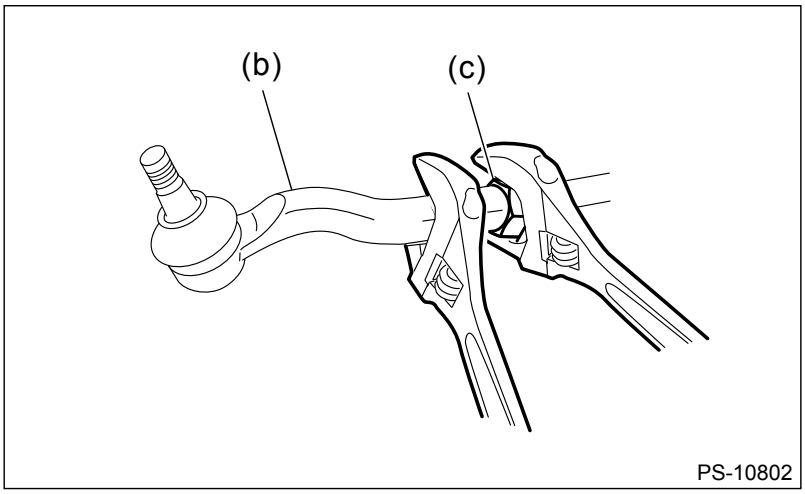
SUBARU SST

Note:
When fixing the steering gearbox assembly in a vise, apply a wooden piece on the flange portion.

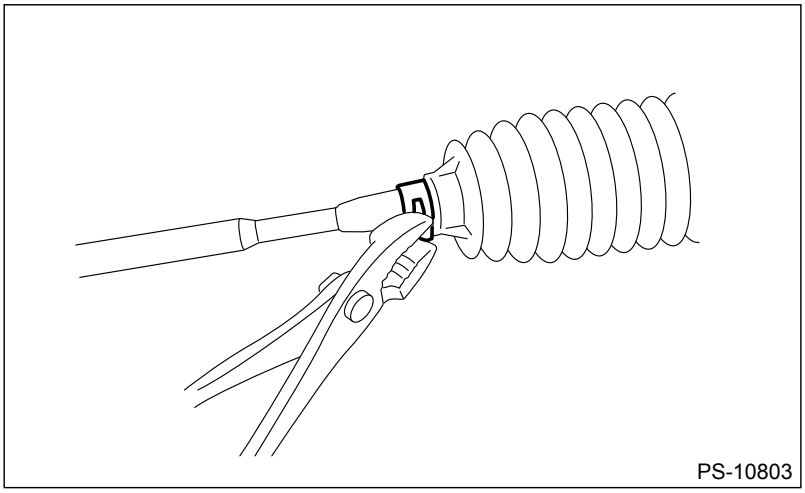
1. Place an alignment mark (a) on the tie-rod end and lock nut.



2. Remove the tie-rod end (b) and lock nut (c) from the steering gearbox assembly.



3. Remove the clip boot tie-rod located on the exterior of the boot steering gearbox.



4. Using a flat tip screwdriver, remove the band boot.

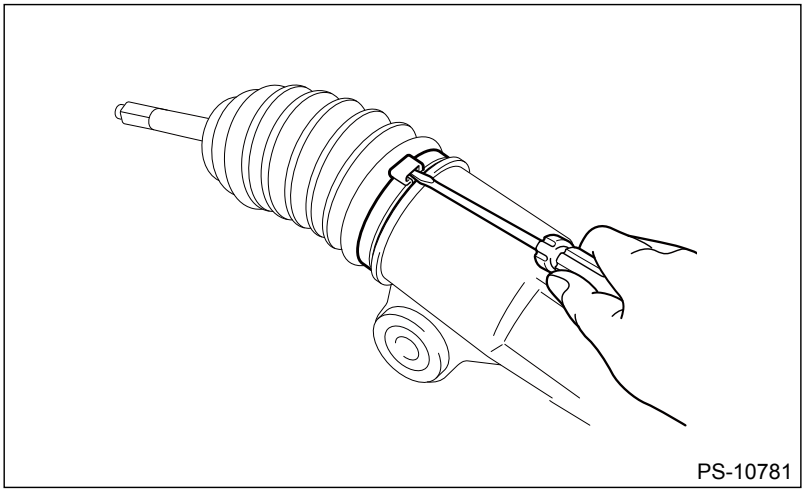
5. Remove the boot steering gearbox.

Caution:

Check the surface for foreign matter such as dust, etc.

Note:

Replace the boot steering gearbox if there is damage, cracks, or deterioration.

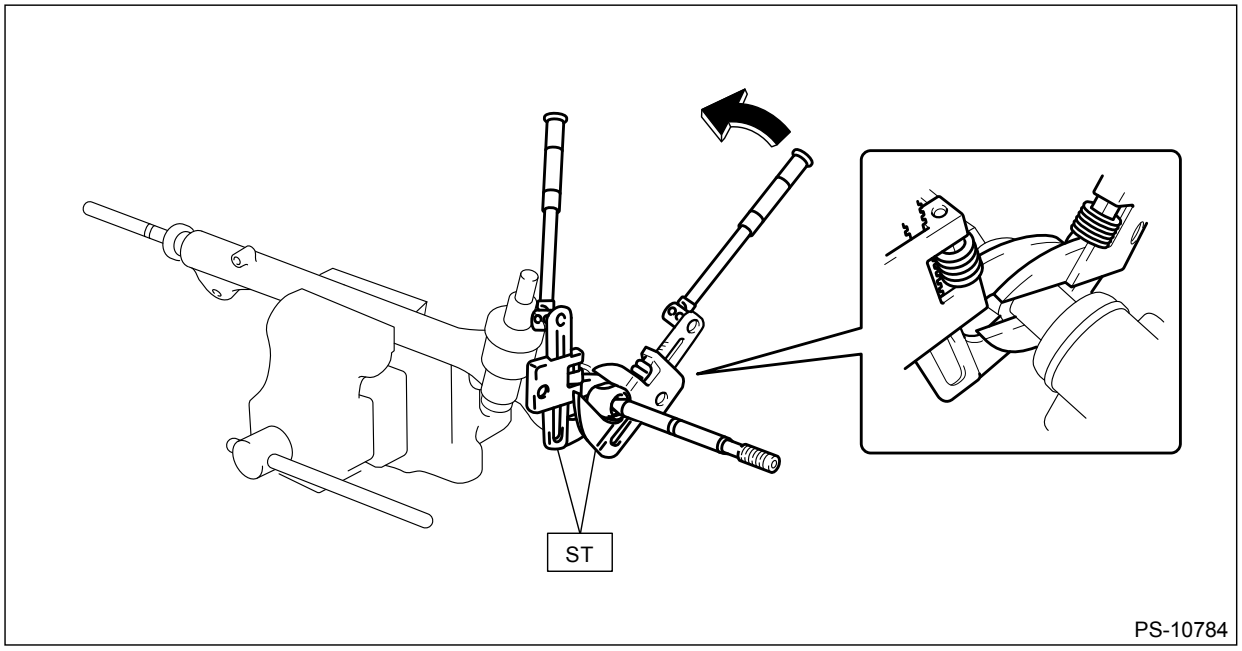


6. Remove the tie-rod.

(1) Use the ST to remove the tie-rod on the LH side.

Preparation tool:

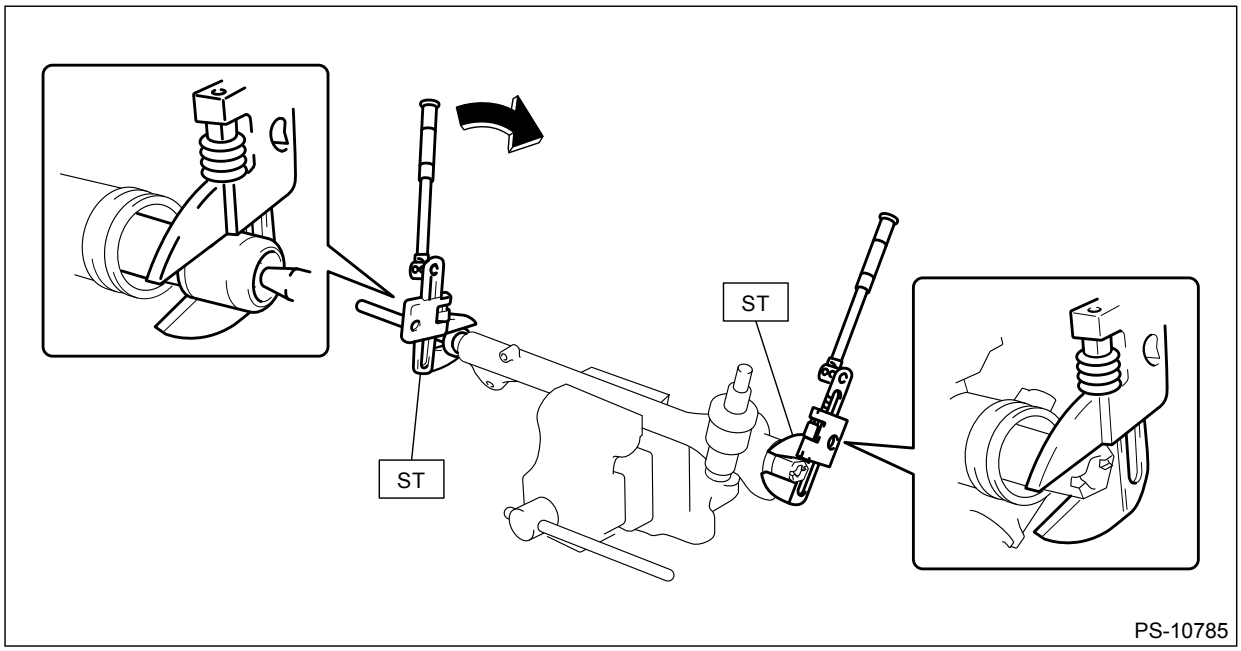
ST: VARIABLE OPEN WRENCH (09922-10010)



(2) Use the ST to secure the steering rack on the LH side (width across flat portion) and remove the tie-rod on the RH side.

Preparation tool:

ST: VARIABLE OPEN WRENCH (09922-10010)



POWER ASSISTED SYSTEM (POWER STEERING) > Steering Gearbox

ASSEMBLY

1. Install the tie-rod into rack.

Caution:
Check the mating face of rack and tie-rod for foreign matter such as dust etc.

(1) Use the ST to secure the steering rack on the LH side (width across flat portion) and install the tie-rod on the RH side.

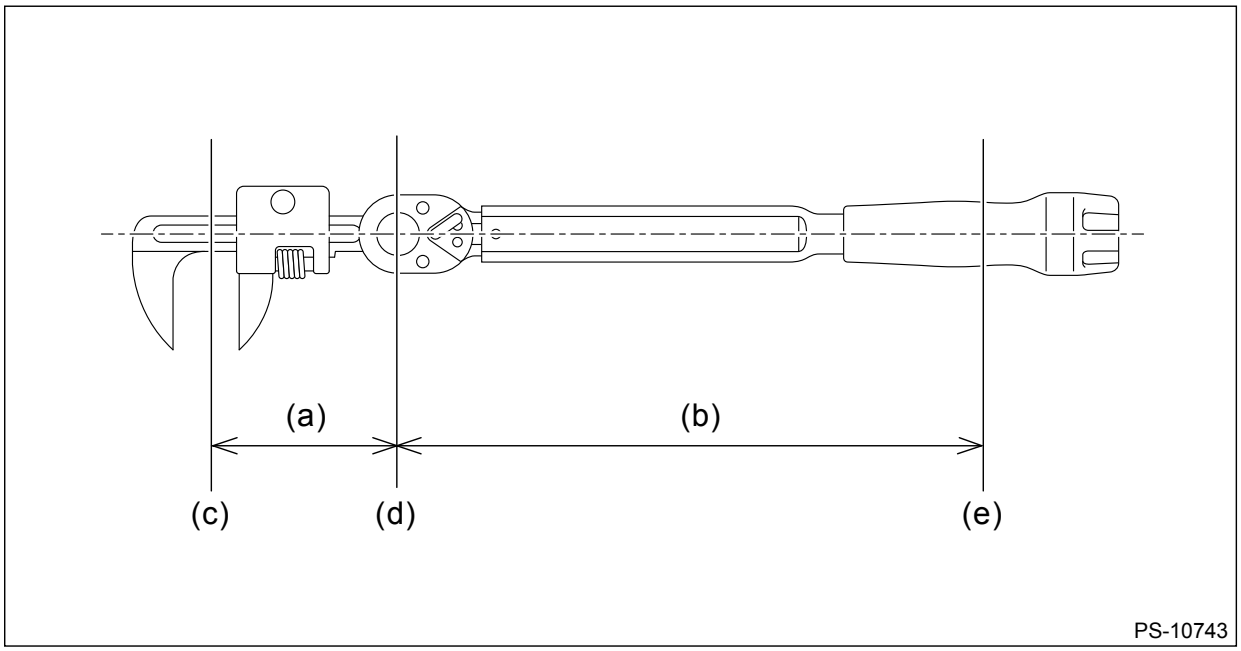
Preparation tool:

ST: VARIABLE OPEN WRENCH (09922-10010)

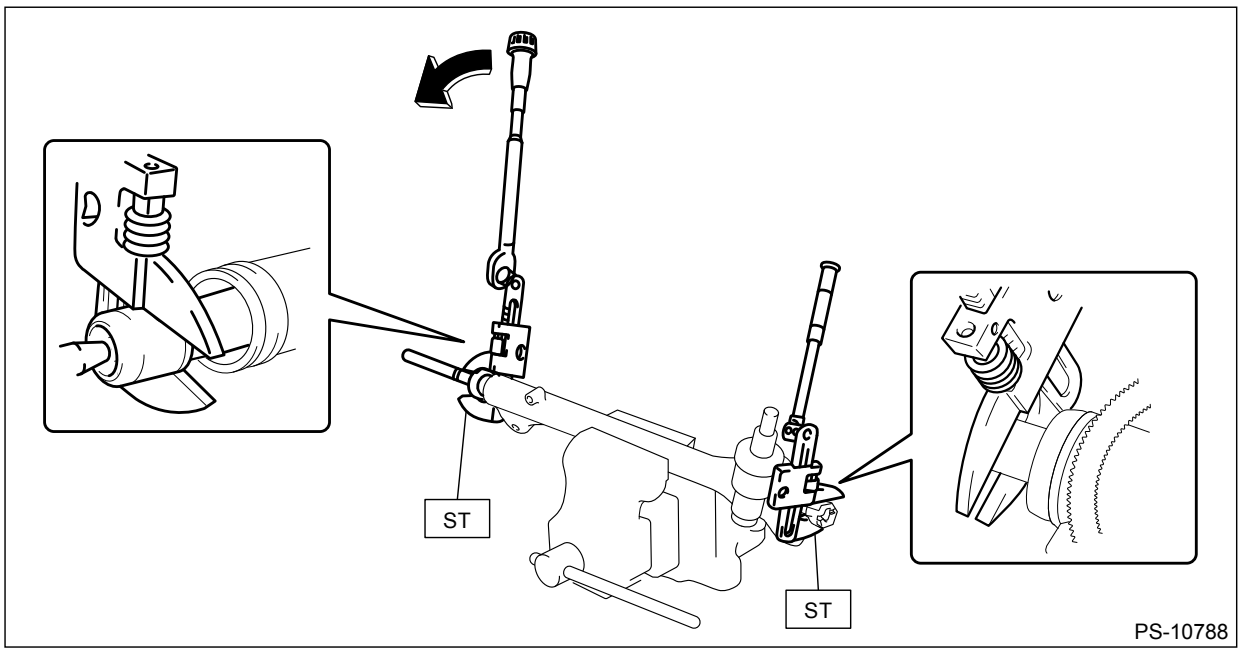
Tightening torque:

Calculation formula
T = 105 N·m (10.7 kgf-m, 77.4 ft-lb) × L1 / (L1 + L2)
T: Tightening torque L1: Effective length of the torque wrench L2: Effective length of the ST

Note:
If the effective length of the torque wrench used is unknown, consult the manufacturer of the torque wrench.



(a) Effective length of the ST (L2)
(b) Effective length of the torque wrench (L1)
(c) Center of drive square of the ST
(d) Center of drive square of the torque wrench
(e) Center of the position where a force is applied by hand



(2) Use the ST to install the tie-rod on the LH side.

Preparation tool:

ST: VARIABLE OPEN WRENCH (09922-10010)

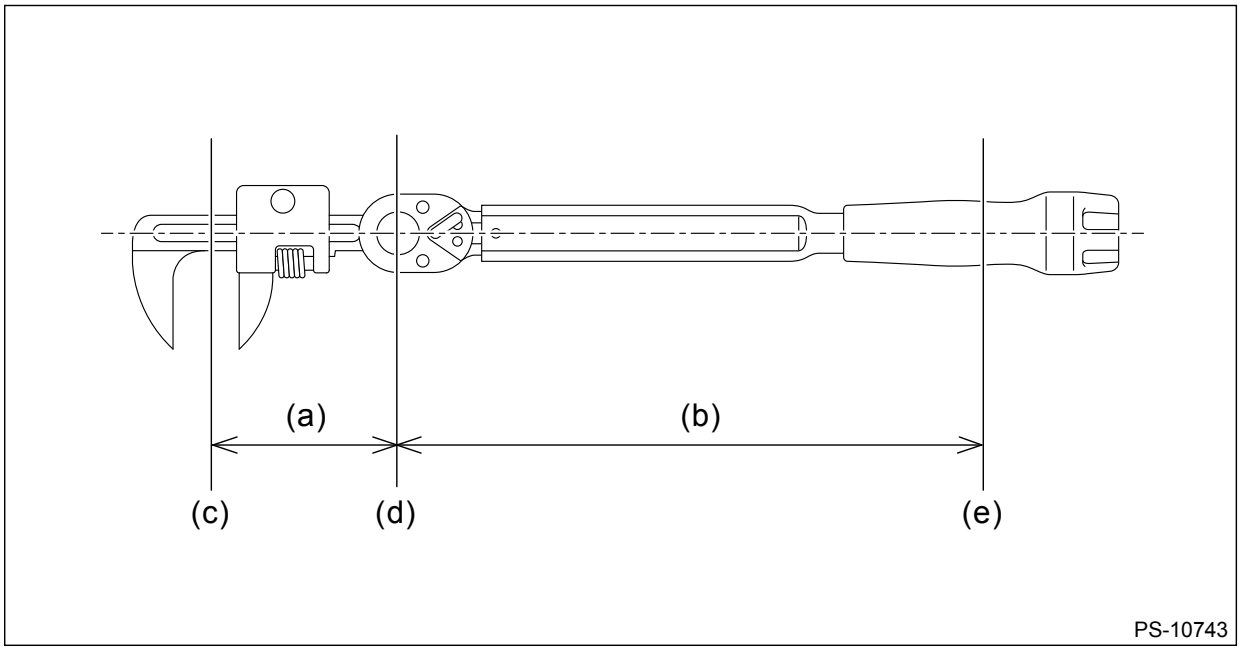
Tightening torque:

Calculation formula
T = 105 N·m (10.7 kgf-m, 77.4 ft-lb) × L1 / (L1 + L2)

T: Tightening torque
L1: Effective length of the torque wrench
L2: Effective length of the ST

Note:

If the effective length of the torque wrench used is unknown, consult the manufacturer of the torque wrench.



(a) Effective length of the ST (L2)
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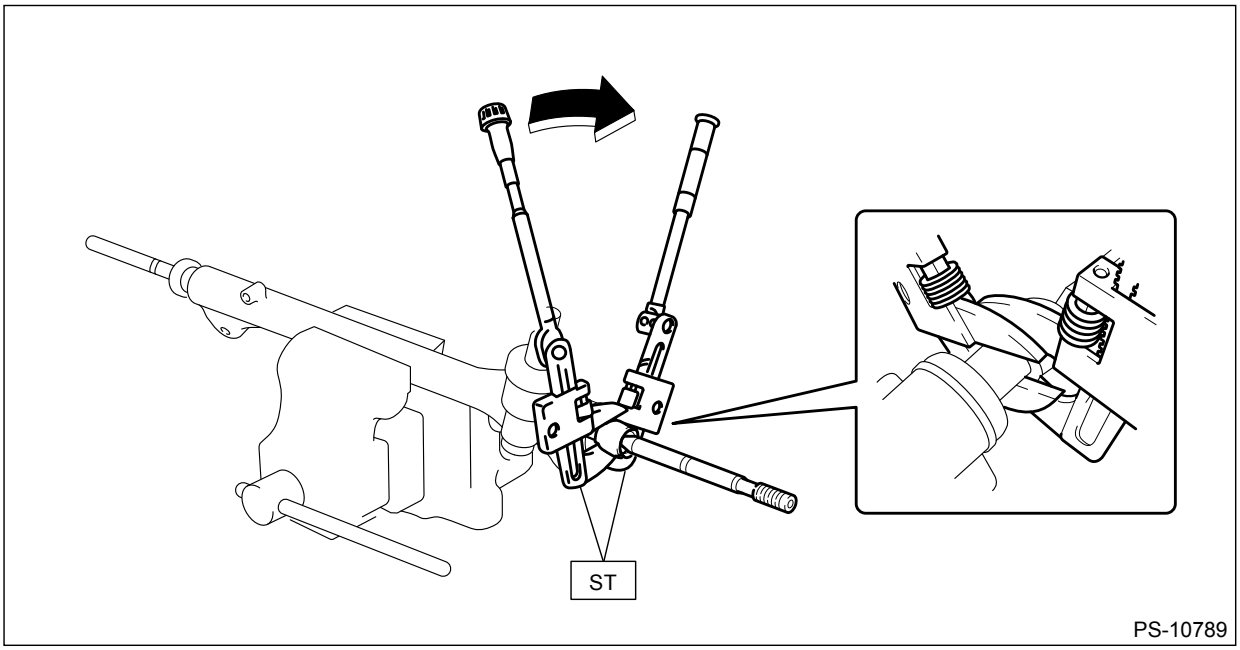
(e) Center of the position where a force is applied by hand



2. Apply a coat of grease to the tie-rod groove, and then install the boot steering gearbox to the housing.

Caution:

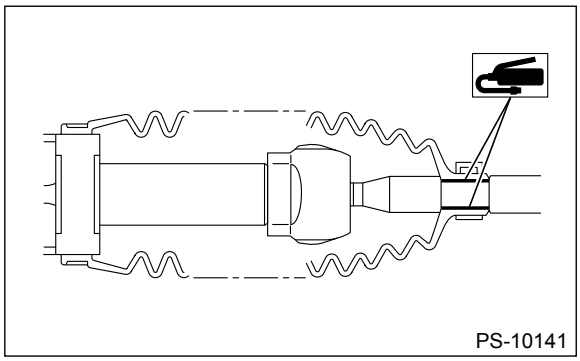
Assemble the small end of the boot steering gearbox in the tie-rod groove first, and then assemble the large end of the boot steering gearbox in the housing.

Note:

Make sure that the boot steering gearbox is installed without unusual inflation or deflation.

Preparation items:

Grease: IDEMITSU APOLLOIL AUTOLEX A, Toshiba silicone TSM650, or equivalent



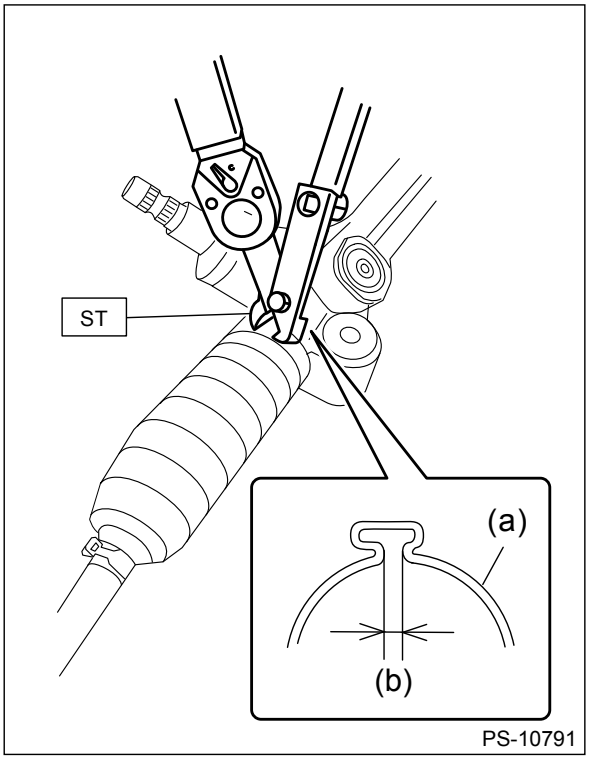
3. Using the ST, crimp the band boot so that the clearance (b) of the band boot (a) crimp portion is 2 mm (0.08 in) or less.

Note:

Use a new band boot.

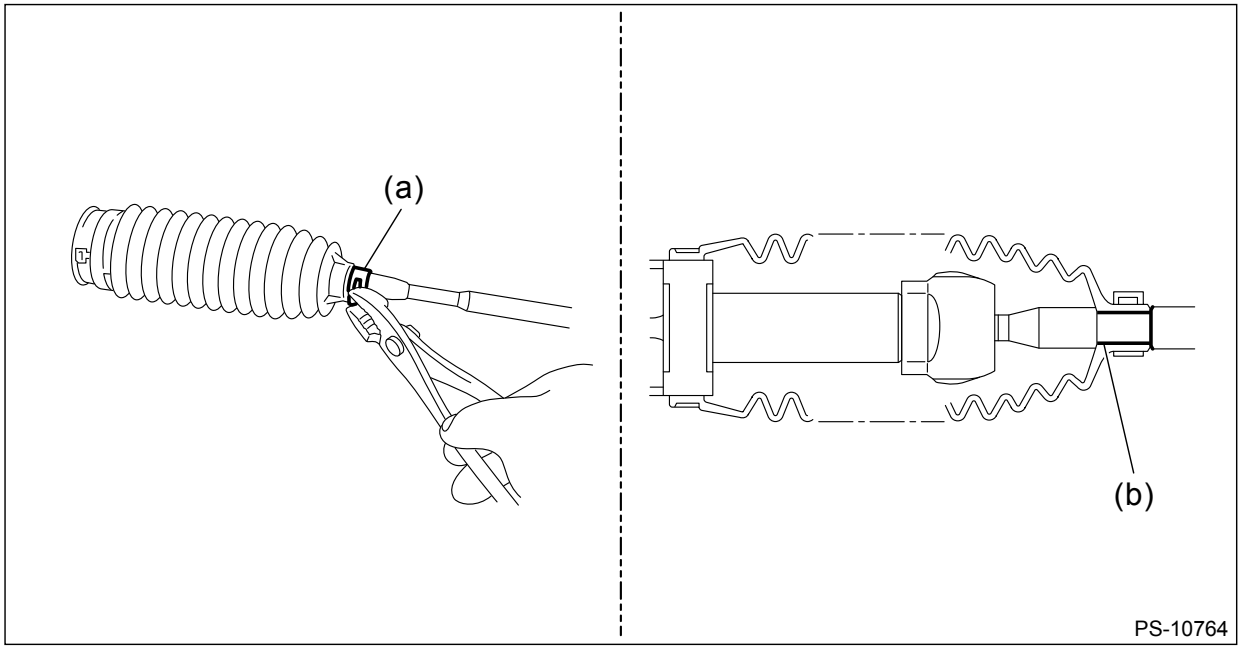
Preparation tool:

ST: BOOT BAND PLIERS (28099AC000)



4. Fix the smaller end of the boot steering gearbox with the clip boot tie-rod (a).

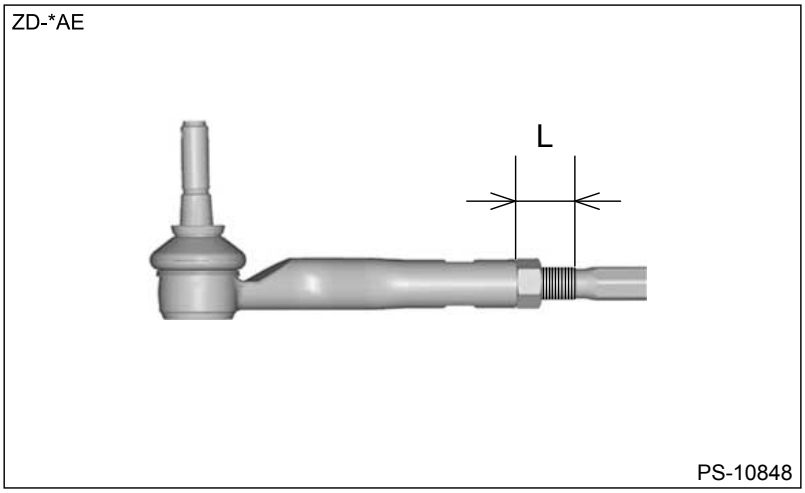
5. After installation, check that the smaller end of the boot steering gearbox is installed to the groove (b) of the tie-rod.



6. If the tie-rod end has been removed, screw in lock nut and tie-rod end to the threaded portion of tie-rod, and tighten the lock nut temporarily in a position as shown in the figure.

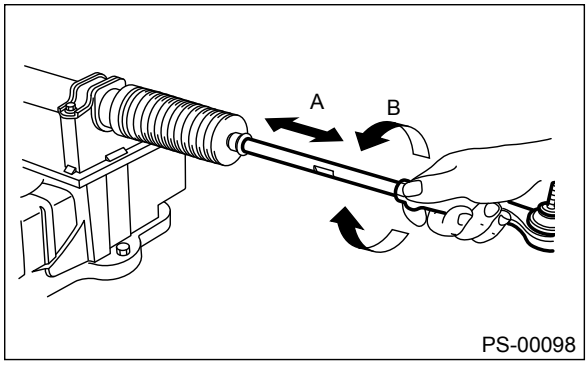
Installed tie-rod length:

L: Approx. 25 mm (0.98 in)



7. Inspect the steering gearbox assembly as follows:

1. "A" Holding the tie-rod end, repeat lock to lock several times as quickly as possible.
2. "B" Holding the tie-rod end, turn it slowly at a radius several times as large as possible.
3. Finally, make sure that the boot steering gearbox is installed in the specified position without inflating.



INSPECTION

1. VISUAL INSPECTION

Check components for wear, damage or other faults. Adjust or replace if necessary.

2. ROTATIONAL RESISTANCE OF GEARBOX

Using the ST, measure the rotational resistance of the steering gearbox assembly.

Preparation tool:

ST: STEERING WORM BEARING ADJUSTING SOCKET (09616-00020)

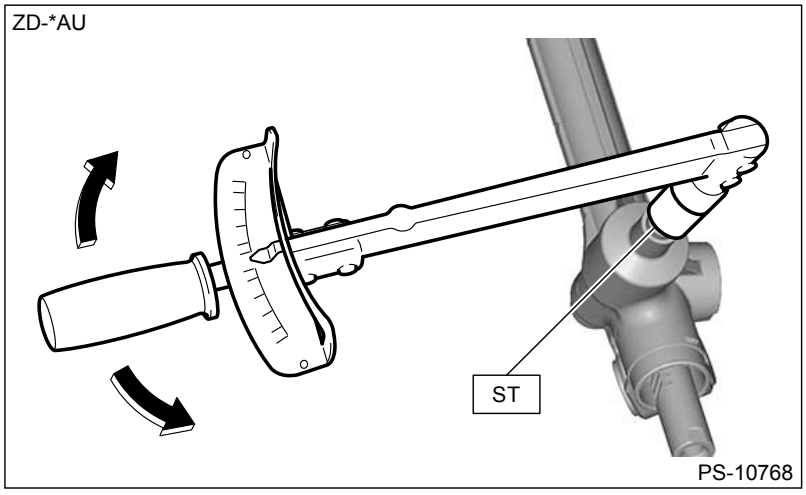
Service limit:

Rotational resistance: 0.9 — 1.6 N·m (0.1 — 0.2 kgf-m, 0.7 — 1.2 ft-lb)

Difference between right and left rotational resistance: 20% or less

Measurement range:

Within ±360° of the stroke center



3. BUSHING INSPECTION

Check the bushing for cracks. If there is any cracks, replace the steering gearbox assembly.

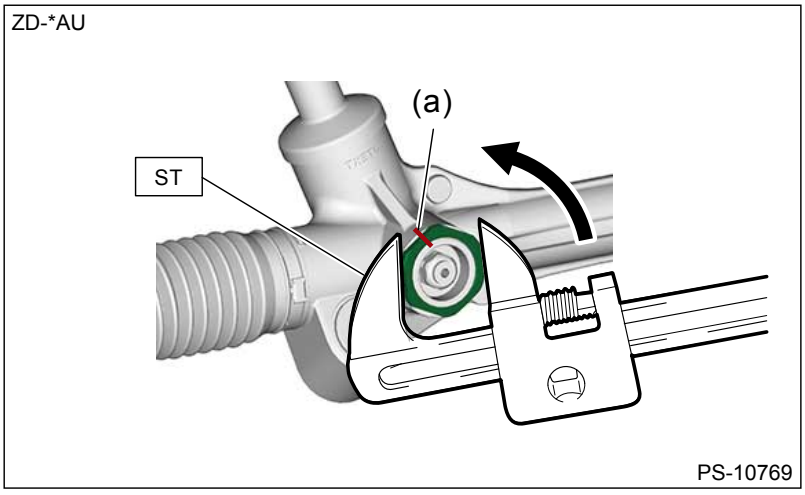
ADJUSTMENT

1. GEARBOX BACKLASH ADJUSTMENT

Caution:
When adjusting the gearbox backlash, make sure you carry out the work in the stroke center of the rack.

1. Remove the steering gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>REMOVAL.
2. Remove the lock nut.
   (1) Place alignment marks (a) in the following locations.
   - Lock nut to Housing
   - Adjusting screw to Housing

   (2) Using the ST, remove the lock nut.
   Preparation tool:
   ST: VARIABLE OPEN WRENCH (09922-10010)



3. Remove the adjusting screw (d).
4. Remove the O-ring (c) and spring gearbox (b).
5. Apply grease to the spring gearbox (b) and to a new O-ring (c)①, and then insert the components into the steering gearbox.
   Preparation items:
   Grease: Multemp AC-P or equivalent
6. Apply grease to the end surface of the adjusting screw (d)②, and then attach the screw to the steering gearbox.

   Caution:
   When assembling the components, be careful not to let the O-ring (c) get caught on the threaded portion.

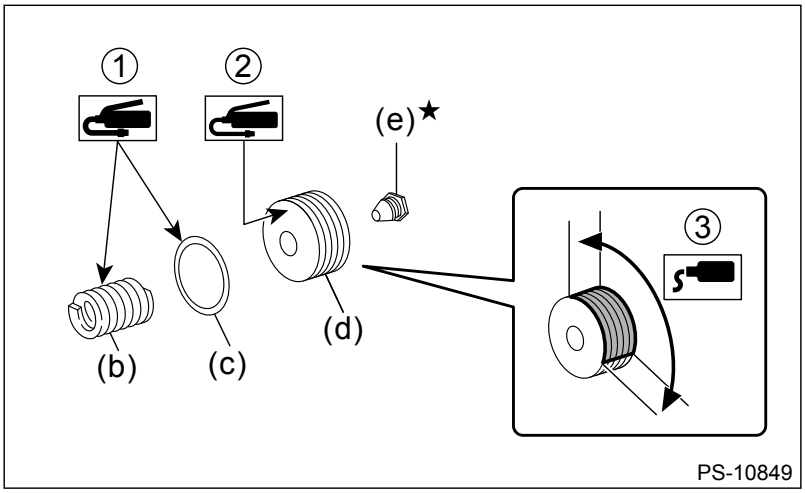
   Preparation items:
   Grease: Multemp AC-P or equivalent
7. Apply liquid gasket to at least 1/3 of the entire perimeter of the adjusting screw (d) thread③, and then temporarily install the steering gearbox.

Preparation items:

Liquid gasket: THREE BOND 1141G or equivalent

Caution:

If the cap (e) has been removed from the adjusting screw (d), replace the cap (e) with a new one.



8. Adjust the rotational resistance of the steering gearbox assembly.

(1) Using the ST, measure the rotational resistance of the steering gearbox assembly.

(2) Tighten the adjusting screw so that the rotational resistance is within the specified value.

Preparation tool:

ST: STEERING WORM BEARING ADJUSTING SOCKET (09616-00020)

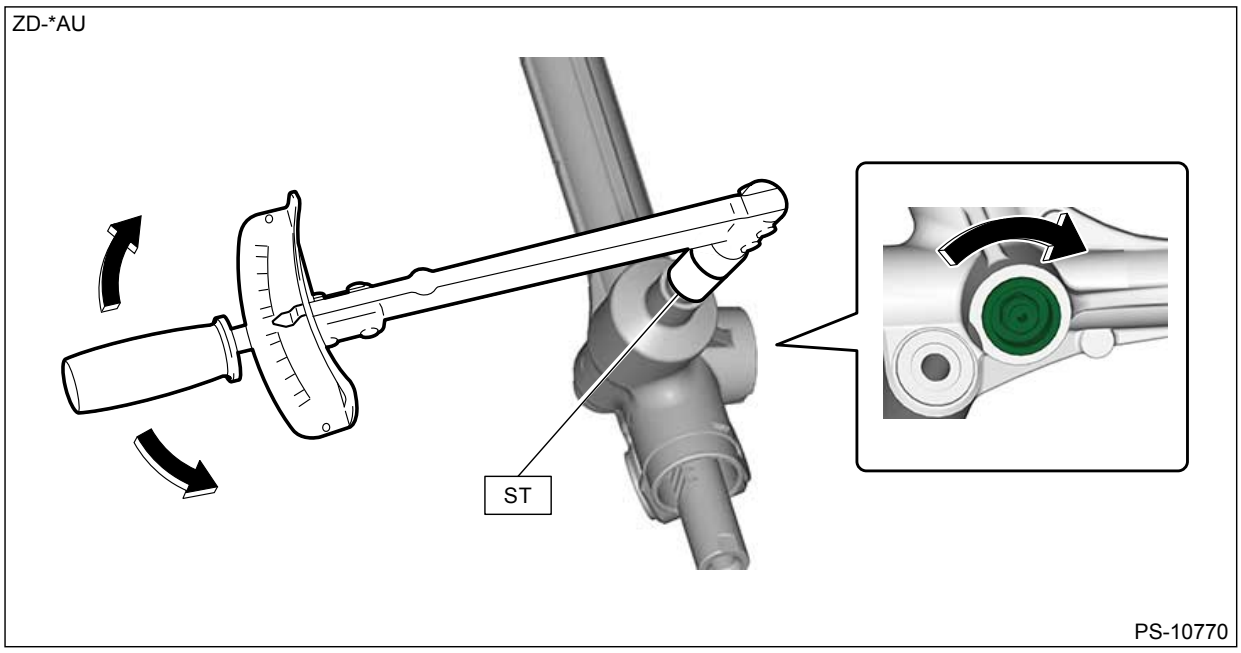
Specification:

Rotational resistance: 0.9 — 1.6 N·m (0.1 — 0.2 kgf-m, 0.7 — 1.2 ft-lb)

Difference between right and left rotational resistance: 20% or less

Measurement range:

Within ±360° of the stroke center



9. Using the ST, install the lock nut.

Caution:

- **Be sure to firmly secure the adjusting screw with the tool in order to prevent the rotational resistance from changing.**
- **After installing the lock nut, check that the rotational resistance is within the specified value.**

Preparation tool:

ST: VARIABLE OPEN WRENCH (09922-10010)

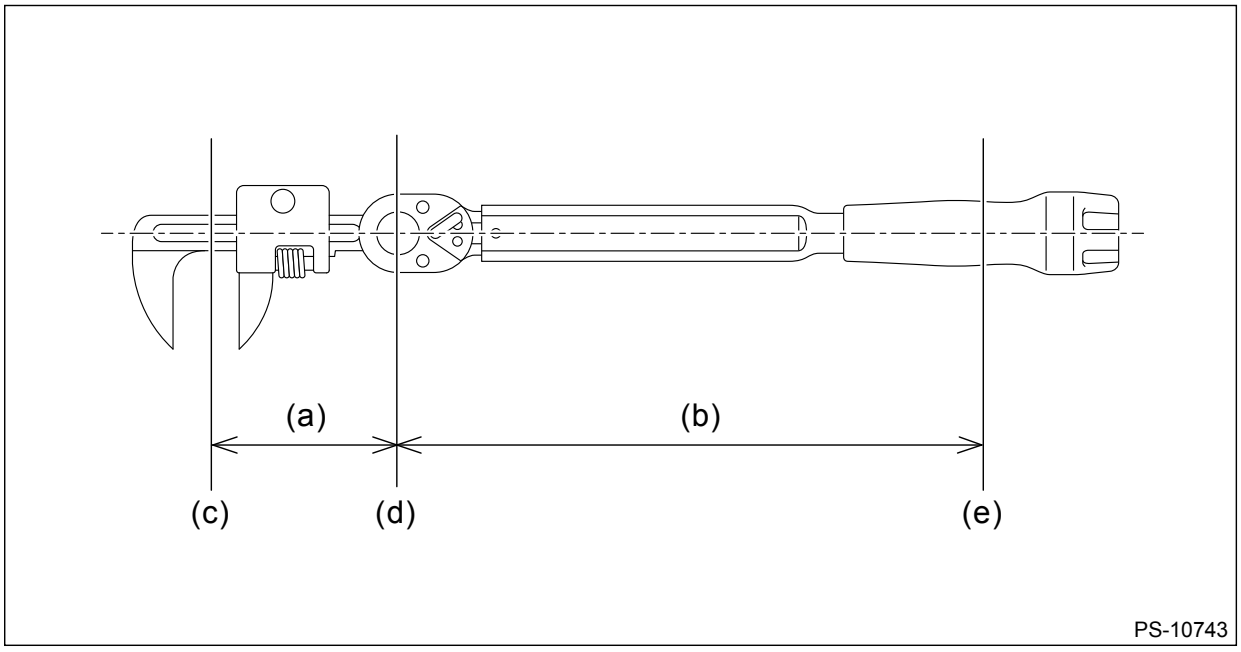
Tightening torque:

Calculation formula
T = 60 N·m (6.1 kgf-m, 44.3 ft-lb) × L1 / (L1 + L2)

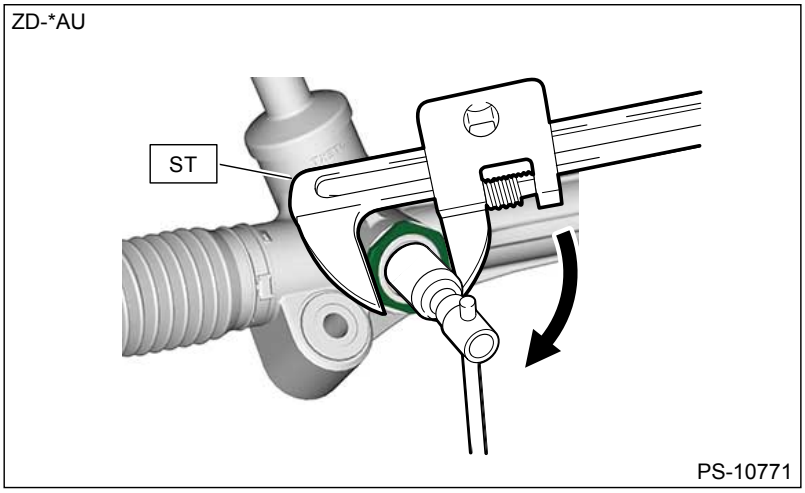
T: Tightening torque
L1: Effective length of the torque wrench
L2: Effective length of the ST

Note:

If the effective length of the torque wrench used is unknown, consult the manufacturer of the torque wrench.



(a) Effective length of the ST (L2)
(b) Effective length of the torque wrench (L1)
(c) Center of drive square of the ST
(d) Center of drive square of the torque wrench
(e) Center of the position where a force is applied by hand

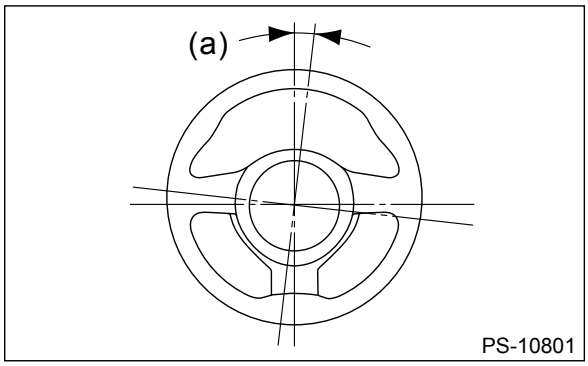


2. FRONT WHEEL ALIGNMENT ADJUSTMENT

1. Adjust the front toe-in. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT TOE-IN.
2. Check the steering angle of the wheels.
   Standard of steering angle:

Inner wheel	36.9°±1.5°
Outer wheel	31.2°±1.5°

3. Check the position of the steering wheel with respect to the straight-ahead position of the vehicle.
   (1) When the steering wheel is in the following condition, perform the steering wheel installation over again.
   - When the wheels are set in the straight-ahead position, the steering wheel spokes are not horizontal.
   - Error is more than 2° on the periphery of the steering wheel.



(a) Within 2°

4. If the steering wheel spokes are not horizontal with vehicle set in the straight-ahead position after this adjustment, correct it by turning the right and left tie-rods in the opposite direction from each other by the same angle. Also check that there is no abnormal steering effort, failure of the steering wheel to return, or other faults.
5. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR

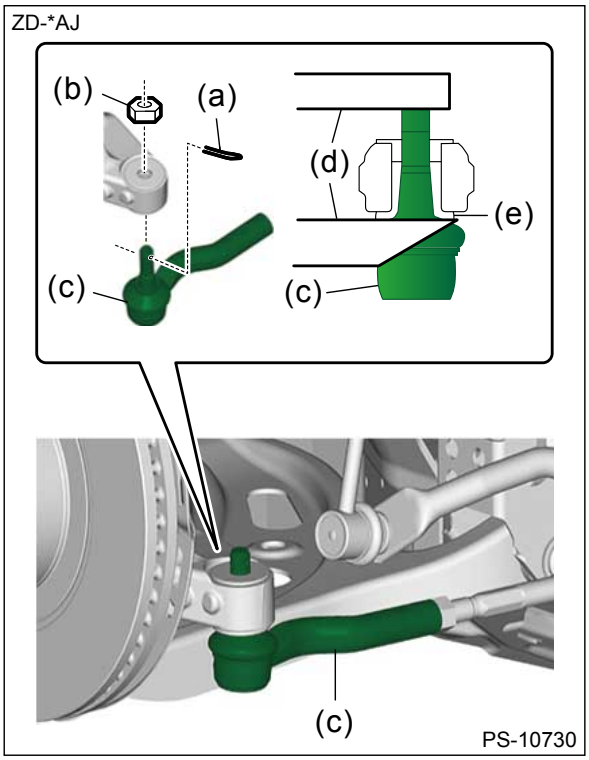
MIDPOINT SETTING MODE.

REMOVAL

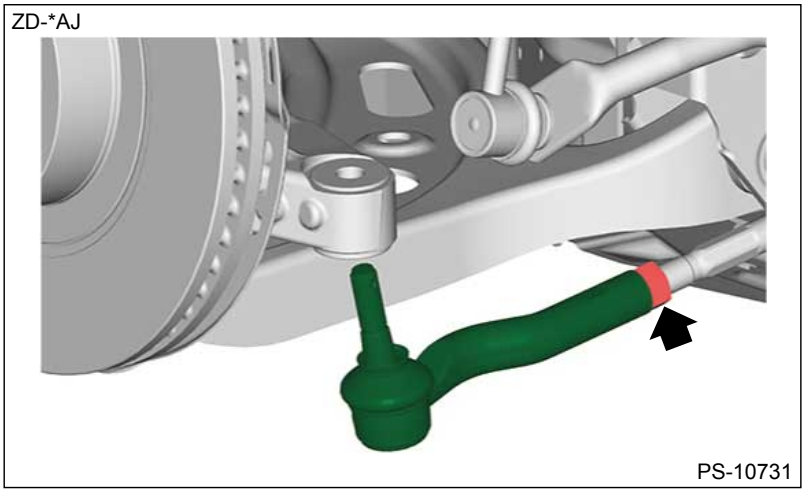
1. Remove the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Disconnect the tie-rod end.
   (1) Remove the cotter pin (a).
   (2) Remove the castle nut (b).
   (3) Using a ball joint puller (d), remove the tie-rod end (c).

Caution:
- **Be careful not to damage the boot of the ball joint.**
- **Be careful not to damage the peripheral parts.**

Note:
Securely hook the ball joint puller (d) to the collar (e).



3. Loosen the lock nut, and remove the tie-rod end.



POWER ASSISTED SYSTEM (POWER STEERING) > Tie-rod end

INSTALLATION

1. Connect the tie-rod ends.

Caution:

Do not apply grease, etc. to the tapered portion of ball stud.

(1) Tighten the castle nut.

Note:

If the ball stud hole and the cutout portion of the castle nut are not aligned after tightening, tighten the castle nut within the range of 60° to align with each other.

Tightening torque:

27 N·m (2.8 kgf-m, 19.9 ft-lb)

(2) Install a new cotter pin.

2. Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

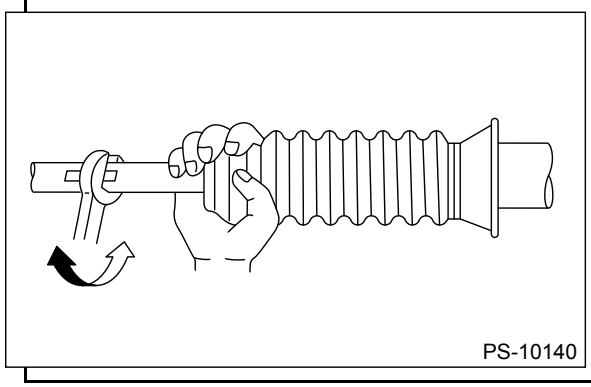
3. After adjusting toe-in and steering angle, tighten the lock nut on tie-rod end.

Caution:

Secure the width across flat portion of the tie-rod end with a tool, and then tighten the lock nut.

Note:

When adjusting toe-in, hold the boot steering gearbox as shown to prevent it from being rotated or twisted. If it becomes twisted, straighten it.



Tightening torque:
85 N·m (8.7 kgf-m, 62.7 ft-lb)

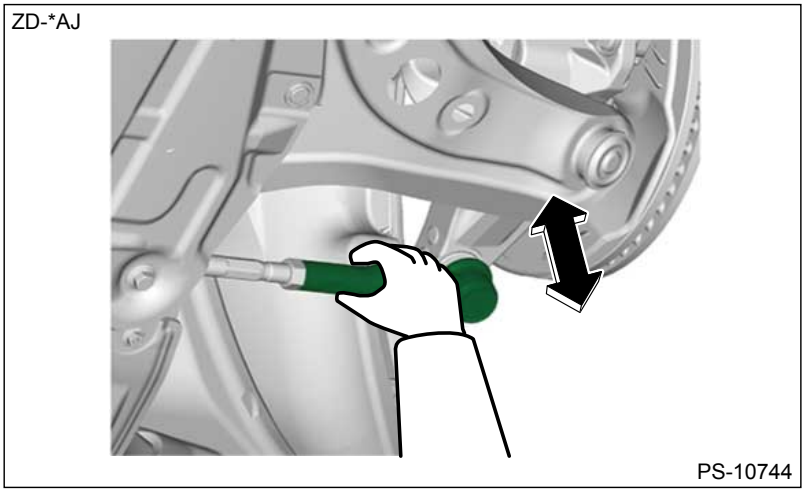
4. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

POWER ASSISTED SYSTEM (POWER STEERING) > Tie-rod end

INSPECTION

1. ON THE VEHICLE INSPECTION

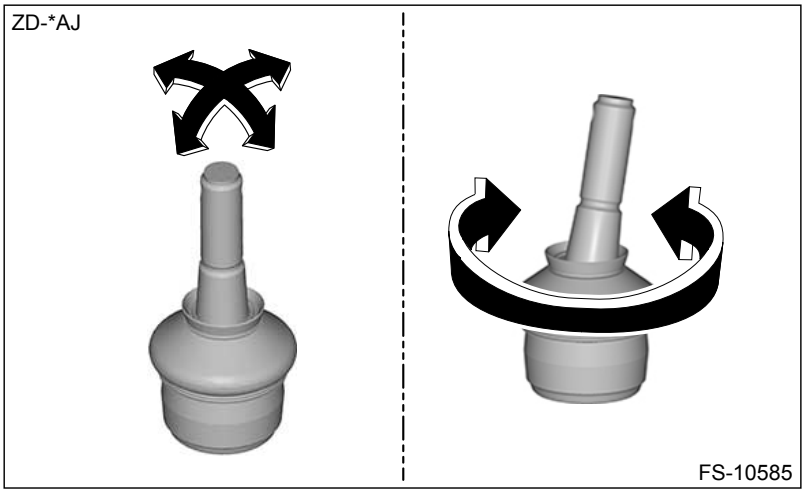
1. Check that there is no deformation, cracks or other damages.
2. Check for excessive rusting.
3. Check the front hub unit bearing for looseness. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>INSPECTION.
4. Rock the tie-rod end up and down to check the ball joint for looseness.



5. If fault is found in the inspection, replace the relevant part.

2. UNIT INSPECTION

1. Move the stud as shown in the figure to check that there is no abnormal interference or play.



2. If fault is found in the inspection, replace the relevant part.

INSPECTION

Check the following items before performing inspection.

- Connections in various parts
- Clearance between the movable parts during steering rotation
- Battery charge status

1. SYMPTOM TABLE

Note:

- **When performing repeated steering operation with the vehicle at standstill, the steering effort may be temporarily heavy because the heat generated in the system activates the power steering protection control.**
  This is not a malfunction caused by the steering system. After a while, it will return to normal steering effort. (In this case, the steering warning light will not come on and there will be no DTC.)
- **When turning the steering wheel with the brake applied when the vehicle is parked, a screeching noise may be generated by the brake disc and pads. This is not a fault in the steering system.**
- **There may be a small vibration around the steering devices when turning the steering wheel at standstill, even though the component parts are operating properly.**

Trouble	Maintenance parts	Contents of inspection	Reference
Steering operation is heavy	Front tires	Air pressure, wear	Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION.
	Front wheel alignment	—	Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
	Front suspension	Inspection of the lower ball joint	Ref. to FRONT SUSPENSION>Front Arm>INSPECTION.
	Steering column	Unit inspection of the steering column	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
	Steering gearbox	Unit inspection of the steering gearbox	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
			Ref. to POWER

	Universal joint	Unit inspection of the universal joint	ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
	The presence of continued operation under high load or dry steering	Using the Subaru Select Monitor, check the data in [Motor Overheat Record].	Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor>LIST.
The steering force required is different in the left and right directions or it is uneven.	Front tires	Air pressure, wear	Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION.
	Front wheel alignment	—	Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION .
	Front suspension	Inspection of the lower ball joint	Ref. to FRONT SUSPENSION>Front Arm>INSPECTION.
	Steering column	Unit inspection of the steering column	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
		Zero point calibration of the torque sensor	Ref. to POWER STEERING (DIAGNOSTICS)>Work Support>LIST > STEERING SENSOR REVISION.
	Steering gearbox	Unit inspection of the steering gearbox	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
	Universal joint	Unit inspection of the universal joint	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
	Front suspension	Inspection of the lower ball joint	Ref. to FRONT SUSPENSION>Front Arm>INSPECTION.
			Ref. to POWER

While driving, steering operation does not change properly depending on the speed, or the steering wheel does not return smoothly.	Steering column	Unit inspection of the steering column	ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
	Steering gearbox	Unit inspection of the steering gearbox	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
	Universal joint	Unit inspection of the universal joint	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
There is a thumping noise during power steering operation, when the steering wheel returns to the neutral position	Front suspension	Inspection of the lower ball joint	Ref. to FRONT SUSPENSION>Front Arm>INSPECTION.
	Steering column	Unit inspection of the steering column	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
	Steering gearbox	Unit inspection of the steering gearbox	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
	Universal joint	Unit inspection of the universal joint	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
	Tie-rod end	Inspection of tie-rod end play	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>INSPECTION.
	Steering column	Unit inspection of the steering column	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
			Ref. to POWER

There is a rubbing sound when the steering wheel is turned during slow driving.	Steering gearbox	• Unit inspection of the steering gearbox • Rubbing sound in the end bushing	ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
	Universal joint	• Unit inspection of the universal joint • Rubbing sound in the dust seal	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
	Steering roll connector	Inspection of the installation condition of the steering roll connector	Ref. to AIRBAG SYSTEM>Roll Connector>INSPECTION .
	Steering wheel to Column cover assembly	Inspection of the installation condition and interference in the steering wheel and column cover assembly	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
An abnormal high-pitched squeaking sound occurs when the steering wheel is slowly turned when the vehicle is stopped.	Steering column	Unit inspection of the steering column	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
	Steering gearbox	Unit inspection of the steering gearbox	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
	Universal joint	• Unit inspection of the universal joint • Abnormal sound from the dust seal	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
	Steering wheel	Inspection of the installation condition and interference in the steering wheel	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
	Steering column	Unit inspection of the steering column	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.

The steering wheel vibrates (accompanied with a noise) during dry steering	Steering gearbox	Unit inspection of the steering gearbox	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSPECTION.
	Universal joint	• Unit inspection of the universal joint • Rotational resistance of the dust seal	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
	Steering wheel	Inspection of the installation condition and interference in the steering wheel	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
P/S warning light remains ON.	Power steering system	Zero point calibration, DTC inspection, harness inspection, CAN communication inspection	Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. INSPECTION OF CLEARANCE

This table lists various clearances that must be correctly adjusted to ensure the normal vehicle driving without interfering noise, or any other faults.

Location	Minimum allowance mm (in)
(a) Universal joint to Toe board reinforce	15 (0.59)
(b) Gearbox (around the boot band) to Crossmember	5 (0.20)
(c) Pinion housing to Crossmember	2.3 (0.09)
(d) Gearbox to Transmission case	15 (0.59)